```
September 24, 2004, 11:06:56; Search time 21.0943 Seconds (without alignments) 3126.121 Million cell updates/sec
                                                                                                                                                                                         1 GPPGEPGPTGLPGPPGERGG.......GEQGVPGDLGAPGPSGPAGG 209
                                                                                                                                                                                                                                                                                                        1017041
GenCore version 5.1.6 (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                        Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                        1017041 segs, 315518202 residues
                                                                                                                                                                                                                                                                                                                                                                                   Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                               - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_rodent:*
sp_virus:*
sp_vertebrate:*
sp_unclassified:*
                                                                                                                                                                                                                                           Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  sp_archea:*
sp_bacteria:*
sp_fungi:*
sp_human:*
sp_invertebrate:*
sp_mammal:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sp_rvirus:*
sp_bacteriap:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               sp_organelle:*
sp_phage:*
                                                                                                                                                                                                                                                                                                                                         seq length: 0
seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 archeap:*
                                                                                                                                                            US-10-658-989A-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sp_plant:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                      SPIREMBL 25:*
                 Copyright
                                                                                                                                                                                                                           BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    :01
                                                                                                                                                              Title:
Perfect score:
                                                                                                                                                                                                                           Scoring table:
                                                                                                                                                                                                                                                                                                                                         Minimum DB
Maximum DB
                                                                OM protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Database :
                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                             Searched:
                                                                                                 Run on:
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Description	O76045 homo sapien Q8n473 homo sapien	Q63079 rattus norv	Q9yib4 cynops pyrr		Q802b5 xenopus lae	Q9ib91 xenopus lae	Q28396 equus cabal	077753 canis famil	Q14046 homo sapien	Q7t2z7 gallus gall	Q90w37 gallus gall	Q14047 homo sapien	Q91717 xenopus lae	Q7zti6 xenopus lae
٠ د د														
SUMMARIES	076045 08N473	063079	Qeros O9YIB4	093251	Q802B5	Q91B91	Q28396	077753	014046	Q7T2Z7	Q90W37	Q14047	091717	Q7ZTI6
DB	। ਹਵਾਵਾ	11	13	13	13	13	9	9	4	13	13	4	13	13
% Query Match Length DB	1461	1453	1455	1445	1449	1447	1418	1487	1160	1269	1420	1487	1486	1486
% Query Match	97.0	9.4.8	83. L	82.9	81.3	79.5	72.6	72.6	72.6	72.6	72.6	72.6	71.8	71.8
Score	1149	1122	986	981	962.5	941	860	860	859	859	859	859	850	850
Result No.	2 2	m	4° LT	9	7	60	σ	10	11	12	13	14	15	16

17 844 71.3 1491 13 Q91718 18 844 71.3 1491 13 Q91718 20 839 70.9 1412 11 Q62032 21 839 70.9 1442 11 Q62033 22 835 70.9 1442 11 Q62033 23 835 70.9 1442 11 Q62033 24 835 70.9 1449 11 Q80XY3 25 833 70.4 1449 13 Q90XY3 26 833 70.4 1449 13 Q90XY8 27 798 65.5 1163 4 Q90XI6 29 776 65.5 1163 4 Q90XIG 29 776 65.5 1163 4 Q90XIG 31 768 64.9 198 11 Q61XI3 32 763 64.4 1997 11 Q61XI3 34 763 64.4 1464 11 Q8EXY3 35 763 64.4 1464 11 Q8EXY3 36 763 64.4 1464 11 Q8EXY3 37 763 64.4 1464 11 Q8EXY3 38 760 64.2 1366 4 QYZSS6 41 775 60.6 1258 13 Q8UUJ3 42 689.5 58.2 1346 13 Q8UUJ3 45 678.5 57.3 1346 13 Q8UUJ3	Q91718 xenopus lae Q7ztm4 xenopus lae Q63123 rattus norv Q62031 mus musculu Q62033 mus musculu	mus cyno onco onco	mus mus mus mus mus mus mus	Q15177 homo sapien Q7z5se homo sapien Q8awl1 brachydanio Q90yj0 brachydanio Q8uuj4 oncorhynchu Q8uuj3 oncorhynchu Q801m5 xenopus lae
844 71.3 1491 11 839 70.9 14429 11 839 70.9 14429 11 839 70.9 14429 11 833 70.5 14429 11 833 70.5 14429 11 833 70.4 14439 11 706 65.5 1163 4 776 65.5 1163 4 776 65.5 1163 4 776 65.5 1163 4 776 65.5 1163 4 776 65.5 1163 4 777 65.1 14429 11 778 64.4 12424 1 778 64.5 1163 4 778 64.5 1163 4 778 64.6 1464 1 778 65.1 1464 1 778 66.5 1163 4 778 66.5 1163 4 778 66.5 1163 4 778 66.5 1163 4 778 66.5 1163 4 778 66.5 1163 4 778 66.5 1163 4 778 66.5 1164 1 778 66.5 1 778	091718 072TM4 063123 062031 062033	Q80X38 Q80VX3 Q9W7R3 Q910C0 Q96QB3 Q96QB3	QBNC04 QP1089 QP1089 QE1431 QECFM4 QBKX2 QBBKX2 QBBKX2 QRENW4 QCTT332	Q15177 Q72586 Q8AW11 Q90YJ0 Q8UUJ4 Q8UUJ3
8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	511111	чнее		4444444
2	14491 14491 14419 1442	441 441 441 441 441 441 441 441 441 441	1163 1253 1222 1222 1464 1364 1314	1366 12366 1358 1358 1358 1346
7.890010844070890010844870789001084m	71.3	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
1111 122222222222222222222222222222222	8 8 8 8 8 8 4 4 6 6 6 6 4 4 0 0 0 0 0	7 7 8 8 8 8 8 6 7 7 7 8 8 8 8 8 8 8 8 8	777 777 768 7683 7683 7683	745 745 717.5 705.5 691.5 678.5
	118 220 220 220	7	и и и и и и и и и и и и и и и и и и и	W 4 4 4 4 4 4 0 0 0 11 01 01 01 01 01 01 01 01 01 01

## ALIGNMENTS

[3]
SEQUENCE FROM N.A.
MEDLINE=89025644; PubMed=3178743;
Tronp G., Kuivaniemi H., Stacey A., Shikata H., Baldwin C.T.,
Jaenisch R., Prockop D.J.;
"Structure of a full-length cDNA clone for the prepro alpha 1(I) chain
of human type I procollagen.";
Biochem. J. 253:919-922(1988); [1]
SEQUENCE FROM N.A.
SEQUENCE FROM N.A.
MEDLINE-, de Wet W., Bernard M., Ramirez F.;
Chu M.L., de Wet W., Bernard M., Ramirez F.;
Chu E.L., de Wet W., Bernard M., Ramirez F.;
Frine structural analysis of the human pro-alpha 1 (1) collagen gene.
Promoter structure, AluI repeats, and polymorphic transcripts.";
J. Biol. Chem. 260:2315-2320(1985). MEDIJNE-88329734; PubMed-2843432; D'Alessio M., Bernard M., Pretorius P.J., de Wet W., Ramirez F.; D'Alessio M., Bernard M., Pretorius P.J., de Wet W., Ramirez F.; Complete nucleotide sequence of the region encompassing the first twenty-five exons of the human pro alpha 1(1) collagen gene."; dene 67:105-115(1988). Homo sapiens (Human). Bukaryota, Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi; Mammalia; Butheria; Primates; Catarrhini; Hominidae; Homo. Created)
Last sequence update)
Last annotation update) PRT; 1461 AA SEQUENCE FROM N.A. MEDLINE=91138770; PubMed=1995349; Maatta A., Bornstein P., Penttinen R.P.; 01-NOV-1998 (TrEMBLrel, 08, 01-NOV-1999 (TrEMBLrel, 12, 01-OCT-2003 (TrEMBLrel, 25, Pro alpha 1(1) collagen. PRELIMINARY; 076045 RESULT 1 076045 

```
Hypothetical
Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               963079
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 3
Q63079
     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \stackrel{>}{\circ}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               634
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          455 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     48
                                                                                                                                                                                                                                              only
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   575 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGFAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12; Gaps
                                                                                                                   for
                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.

KOTKKO J.M., Earley J.J., Nuytinck L., DePaepe A., Prockop D.J.,
Slanitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
Submitted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AF017179, AAB94054.2; -
GO, GO:0005581; C:collagen, IEA.
GO, GO:0005201; F:extracellular matrix structural constituent; IEA.
InterPro; IPR008161; Clg_helix.
InterPro; IPR008161; Clg_helix.
InterPro; IPR008181; Fibrinogen.
InterPro; IPR00885; Fib_collagen.
InterPro; IPR001885; Fib_collagen_C.
InterPro; IPR001885; Fib_collagen_C.
InterPro; IPR001087; VWF_C.
                                                                                                                                                                               MEDIANCE 98107942; PubMed=9443882; Mill all all be pape A., Nuytinck L., Earley J., Forkko J., Ala-Kokko L., De Paepe A., Nuytinck L., Earley J., Prockop D.J.; Prockop D.J.; Analysis of the COLIA1 and COLIA2 genes by PCR amplification and scanning by conformation-sensitive gel electrophoresis identifies (COLIA1 untations in 15 patients with osteogenesis imperfecta type identification of comon sequences of null-allele mutations."; Am. J. Hum. Genet. 62:98-110(1998).
 "Highly conserved sequences in the 3'-untranslated region of the COLIA1 gene bind cell-specific nuclear proteins."; FESS Lett. 279:9-13(1991).
                                                     SEQUENCE FROM N.A.
MEDLINES-92157916; PubMed=1787829;
MEDLINES-92157916; PubMed=1787829;
Westerhausen A., Constantinou C.D., Pack M., Peng M.Z., Hanning Olsen A.S., Prockop D.J.;
"Completion of the last half of the structure of the human gene the Pro alpha 1 (1) chain of type I procollagen (COLIAI).";
Matrix 11:375-379 (1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1461 AA; 138630 MW; 9ACF6DE30EA78E21 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Created)
Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               dsPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ffam; PF01410; COLF1; 1. Pfam; PF01410; COLF1; 1. Pfam; PF01391; Collagen; 18. Probom; PD000007; Clg helix; 2. Probom; PD002078; Fib_collagen_C; 1. SWART; SM00038; COLF1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (TrEMBLrel. 22, C
(TrEMBLrel. 22, L
(TrEMBLrel. 25, L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROSITE; PS01208; VWFC 1; 1.
PROSITE; PS50184; VWFC 2; 1.
Collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRELIMINARY;
                                                                                                                                                       [6]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q8N473
Q8N473;
01-OCT-2002 (
01-OCT-2002 (
01-OCT-2003 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               635
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 2
Q8N473
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
```

```
49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           578 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 637
                                                                                                                                                                                                                                                                                                                      Straubberg R.;
Straubberg R.;
Submitted (AUG-2002) to the EMBL/GenBank/DDBJ databases.

EMBL; BC086531; AA436531.1;
R GO; GO:0005521; AA436531.1;
R GO; GO:0005201; F:extracellular matrix structural constituent; IEA.

R GO; GO:0005201; F:extracellular matrix structural constituent; IEA.

R GO; GO:0005201; F:extracellular matrix structural constituent; IEA.

R InterPro; IPR001816; Cladson.

R InterPro; IPR001816; Fibrinogen.

R InterPro; IPR001885; Fib collagen.

R Frodom; PF01391; Collagen; 18.

R Frodom; PF0018078; Fib collagen.

R Frodom; PF002078; Fib collagen.

R Frodom; PF002078; Fib collagen.

R Frodom; PF00181; I.

R FRAM: SM0018; COLFI; I.

R FWART; SM0018; COLFI; I.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            458 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=Sprague-Dawley, TISSUE=Tooth,
Brandsten C., Lundmark C., Christersson C., Hammarstrom L., Wurtz T.,
"Expression of Collagen alphal(I) mRNA variants during Tooth and Bone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kattus norvegilus (kat).
Bukaryota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
                                    Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Primates, Catarrhini, Hominidae, Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Hypothetical protein; Collagen.
SEQUENCE 1464 AA; 139011 MW; B0581F8D1C89DDE8 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      638 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-NOV-1996 (TrEMBLrel. 01, Created).
01-UTN-1998 (TrEMBLrel. 06, Last sequence update)
01-CT-2003 (TrEMBLrel. 25, Last annotation update)
Collagen alphal (Fragment).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    97.0%; Score 1149; DB 4;
93.6%; Pred. No. 8.1e-72;
ive 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT; 1453 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
STRAIN=Sprague-Dawley; TISSUE=Tooth;
Wurtz T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PROSITE; PS01208; VWFC_1; 1. PROSITE; PS50184; VWFC_2; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE OF 1-1092 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best Local Similarity 93.6
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rattus norvegicus (Rat)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Dent. Res. 0:0-0(0)
(Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Formation in the Rat
                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
TISSUE=Brain;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=10116;
                                                                                                                                      NCBI_TaxID=9606
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HAPP REPARED TO THE SERVICE OF THE S
```

ι;

517

```
447 GPPGDPAGEEGKRGARGEPGPSGLPGPPGERGGPGSRGFPGADGVAGPKGPSGERGSPGPA 506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                507 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGAPGARGQA 566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    567 GVMGFPGPKGTAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGAPGPAGPAGERGEQGPA 626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (1)—CE FROM N.A.

STRAIN=FVB/N; TISSUE=COlon;
STRAIN=FVB/N; TISSUE=COlon;
Strausberg R.; TISSUE=Colon;
R. Submitted (Appr. 2003) to the EMBL/GenBank/DDBJ databases.

EMBL; BC050014; AAHSO014.1; -.

R GO; GO:0005581; C:collagen; IEA.

InterPro; IPR001816; Fibrinogen C.

InterPro; IPR001816; Fibrinogen C.

InterPro; IPR001816; Fibrinogen C.

InterPro; IPR00107; VWF C.

PEam; PF01410; COLFI; 1.

PRODON; PD002078; Fibr collagen C; 1.

R Pfam; PF01410; COLFI; 1.

PRODON; PB001208; VWFC 1; 1.

PROSITE; PS01208; VWFC 1; 1.

PROSITE; PS01208; VWFC 2; 1.
                   Gaps .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              081039;
081039;
081039;
081040-2003 (TrEMBLrel. 24, Created)
01-JUN-2003 (TrEMBLrel. 25, Last annotation update)
01-OCT-2003 (TrEMBLrel. 25, Last annotation update)
Hypothetical protein.
Why musculus (Mouse).
Bukaryota, Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
11]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match

94.8%; Score 1122; DB 11; Length 1453;
Best Local Similarity 91.4%; Pred. No. 5.9e-70;
Matches 201; Conservative 2; Mismatches 5; Indels 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Collagen.
NON TER 1 1
SEQUENCE 1453 AA; 137887 MW; E6896BDC19A4AlD8 CRC64;
Submitted (FEB-1998) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGARG 666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT; 1453 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    081039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 4
0(810)9
010
0810)09
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
01-01
0
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
```

```
503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             506
                                                                                                                                                                                                                                                                                                                                                               999
                                                                                                                                                                                                                                                                                                                                                                                                                                                          567 GVMGFPGFKGTAGEPGKAGERGLPGPPGAVGPAGKDGEAGAQGAPGPAGPAGPAGERGEGGGPA 626
                                                                                                                                                                                                                                                                                                           49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                        109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TISSUERCE FROM N.A.

TISSUER Egenerate forelimbs;

XX MEDINES 199407244, PubMed=1044166;

XX MEDINES 199407244, PubMed=1044166;

Asabina K., Obara M., Voshizato K.;

Asabina K., Obara M., Voshizato M.;

Ind development of the blastema of regenerating newt limb.";

Dev. Dyn. 216.59-71(1999).

EMBL; AB015438; BA436973.1; -.

DR COOGOSS81; C.collagen, IEA.

CO; GO:0005201; F:extracellular matrix structural constituent; IEA.

InterPro; IPR0008160; Collagen.

InterPro; IPR001007; VWF.C.

InterPro; IPR00100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  444 GPPGPSGEEGKRGSRGEPGPAGPPGPAGERGGPGSRGFPGSDGASGPKGAPGERGSVGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARQQA
                                                                                                                                                                                                                          1 GPP------GEPGPIGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12; Gaps
                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-MAY-1999 (TrEMBLrel. 10, Created)
01-MAY-1999 (TrEMBLrel. 10, Last sequence update)
01-MAY-1999 (TrEMBLrel. 24, Last annotation update)
01-JUN 2003 (TrEMBLrel. 24, Last annotation update)
Alpha 1 type I collagen.
Cynops.pyrthogaster (Japanese common newt)
Enkaryota; Metacoa; Chodata; Craniata; Vertebrata; Euteleostomi;
Amphibia; Batrachia; Caudata; Salamandroidea; Salamandridae; Cynops.
NOSI_TAXID=8330;
                                                                                                                                     12;
                                                                           Length 1453;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               83.5%; Score 989; DB 13; Length 1450;
80.5%; Pred. No. 9.5e-61;
tive 7; Mismatches 24; Indels 12.
                                                                                                                                     Indels
Hypothetical protein.
SEQUENCE 1453 AA; 138032 MW; 0B7F06BBB9AlD5EA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        169 GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            627 dspárodipápadppápadkokodovodoldabápadaká 666
                                                                        Query Match
94.3%; Score 1116; DB 11;
Best Local Similarity 90.5%; Pred. No. 1.5e-69;
Matches 199; Conservative 4; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity 80.5 Matches 177; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q9YIB4
Q9YIB4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ઠે
                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                     유
                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś.
```

Fri Sep 24 11:45:39 2004

g ઠે 엄 PRT; 1445 AA

52 GSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVM 111 112 GPPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSP 171 566 GPPGPKGAAGEPGKPGERGVAGPPGAVGAPGKDGEAGAQGPPGPAGPAGERGEQGPAGPP 625 1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPK 51 12; Gaps Query Match 82.9%; Score 981; DB 13; Length 1445; Best Local Similarity 82.0%; Pred. No. 3.4e-60; Matches 178; Conservative 5; Mismatches 22; Indels 12 172 GFOGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208 d ò qq 엄 ò

444 GPPGEPGEGKRGSRGEPGPAGPPGPAGERGGPGSRGFPGSDGASGPKGAPGERGFVGPA 503 563 49 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKIGPPGPAGQDGRPGPPGARGQA 108 109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPA 168 564 GVMGFPGPKGAAGEPGKNGEKGVAGPPGAVGLPGKDDAGAQGPPGPAGPAGBRGEQGPA 623 48 A Klein B. Strausberg R.;

A Klein B. Strausberg R.;

Louintted (MAR-2003) to the EMBL/GenBank/DDBJ databases.

Submitted (MAR-2003) to the EMBL/GenBank/DDBJ databases.

EMBL; BCC49829; AAH49829.1; -..

EMBL; BCC49829; AAH49829.1; -..

EMBL; BCC49829; CALlagen; IEA.

GO; GO:0005201; F:extracellular matrix structural constituent; IEA.

InterPro; IPR0008160; Collagen.

R InterPro; IPR001085; Fib collagen.

R Pfam; PF01319; Collagen; 18.

R Pfam; PF01311; Collagen; 18.

R Pfam; PF01311; Collagen; 18.

R SMART; SM00038; COLFI; 1.

R SMART; SM00038; COLFI; 1. 1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 504 GPKGSSGESGRPGEPGLPGAKGLTGSPGSPGSDGKTGPAGAPGQDGRAGPPGPPGARGQS Hypothetical protein. Renopus laevis (African clawed frog). Bukaryota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi; Amphibia; Batrachia; Anura; Mesobatrachia; Pipoidea; Pipidae; Xenopus laevis (African clawed frog). Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi, Amphibia, Batrachia, Anura, Mesobatrachia, Pipoidea, Pipidae; Xenopodinae, Xenopus. Query Match 81.3%; Score 962.5; DB 13; Length 1449; Best Local Similarity 79.5%; Pred. No. 6.5e-59; Matches 175; Conservative 8; Mismatches 22; Indels 15; 1449 AA; 137464 MW; 4B32E20BECCE978C CRC64; 169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208 624 GGPGFQGLPGPPGPAGESGKPGEQGVPGDV---GPSGPAG 660 Created) Last sequence update) Last annotation update) Q9IB91; 01-OCT-2000 (TrEMBLrel. 15, Created) 01-OCT-2000 (TrEMBLrel. 15, Last sequence update) 01-UUN-2003 (TrEMBLrel. 24, Last annotation update) Type I collagen alpha 1. PROSITE; PS01208; VWFC\_1; 1.
PROSITE; PS50184; VWFC\_2; 1.
HYDOLHetical protein.
SEQUENCE 1449 AA; 137464 01-JUN-2003 (TrEMBLrel. 24, 01-JUN-2003 (TrEMBLrel. 24, 01-OCT-2003 (TrEMBLrel. 25, PRELIMINARY; Xenopodinae, Xenopus. SEQUENCE FROM N.A. NCBI\_TaxID=8355; COLLAI. **091B91** ઠ g ò 셤 à g à 

3

SEQUENCE FROM N.A.

Goto T., Katada T., Kinoshita T., Kubota H.Y.;

"Expression and characterization of Xenopus type I collagen alpha 1
("CLIA1) during embryonic development.";

Submitted (NOV-1999) to the EMBL/GenBank/DDBJ databases.

EMBL; AB034701; BAA94972.1; -.

PRELIMINARY;

RESULT 7. Q802B5 ID Q802B5

```
61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                            121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             543 GEPGKAGEKGLPGAPGLRGLPGKDGETGAAGPPGPAGPAGERGEQGAPGPSGFQGLPGPP 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
MEDLINE=88340920; Pubmed=9676231;
Du F., Acland G.M., Ray J.;
"Differential splicing of type II procollagen mRNA in canine retina.";
Anim. Biotechnol. 9:15-20(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                      1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0; Gaps
                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL, AF023169; AAC62178.2; -...
EMBL, AF023169; AAC62178.2; -...
GO, GO:0005581; C:collagen; IEA.
GO; GO:0005201; F:extracellular matrix structural constituent; IEA.
InterPro; IPR00181; Clg_helix.
InterPro; IPR001816; Collagen.
InterPro; IPR00185; Fib collagen.
InterPro; IPR001007; VWF_C.
InterPro; IPR001007; VWF_C.
Pfam; PF011391; Collagen; 18.
Pfam; PF00093; vwc_1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Carnivora, Fissipedia, Canidae, Canis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
MEDLINE=20480698; PubMed=11024291;
Du F., Acland G.M., Ray J.;
"Cloning and expression of type II collagen mRNA: evaluation as candidate for canine oculo-skeletal dysplasia.";
Gene 255:307-316(2000).
                                                                                                                                     ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 72.6%; Score 860; DB 6; Length 1487; Best Local Similarity 74.0%; Pred. No. 8.2e-52; Matches 154; Conservative 10; Mismatches 44; Indels
                                                                          Length 1418;
                                                                                                                                  44; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1487 AA; 141875 MW; 25873EACIE311DB8 CRC64;
             1418 AA; 134343 MW; 115FCD19EB8696A3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Last sequence update)
Last annotation update)
                                                                       72.6%; Score 860; DB 6; ilarity 74.0%; Pred. No. 7.9e-52; Conservative 10; Mismatches 44
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT; 1487 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      603 GPPGEGGKPGDQGVPGEAGAPGLVGPRG 630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ProDom, PD000007; Clg helix; 4.
ProDom; PD0002078; Fib_collagen_C; 1.
SWART; SM0018; COLF; 1.
SMART; SM00214; VWC; 1.
PROSITE; PS50184; VWFC_1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-NOV-1998 (TrEMBLrel. 08, 01-NAR-2001 (TrEMBLrel. 16, 01-JUN-2003 (TrEMBLrel. 24,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Type IIA procollagen.
Canis familiaris (Dog
                                                                       Query Match
Best Local Similarity
Matches 154; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=9615;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Collagen.
SEQUENCE
             SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  077753
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ઠે
                                                                                                                                                                                                                                                a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                         셤
                                                                                                                                                                                                                                                                                                                                                                                                                                          ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              50 PKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQAG 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          110 VMGFPGPKGAAGERGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAG 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 GPPGEPG------PTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAG 49
RGO; GO:0005581; C:collagen; IEA.
RGO; GO:0005201; F:extracellular matrix structural constituent; IEA.
RINGEPTEO; IPRO03161; Clg helix.
RINGEPTEO; IPRO03161; Cll agen.
RINGEPTEO; IPRO01007; VWF_C.
RINGEPTEO; IPRO01007; VWF_C.
REPTEO; PRO01007; VWF_C.
REPTEO; PRO01007; VWF_C.
REPTEO; PRO00085; Fib_Collagen.
REPTEO; RE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Todhunter R.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DHIR; TASAGT, TASAGT, TABLE OF THE TASAGT, C:collagen; IEA.

GO; GO:0005201; F:extracellular matrix structural constituent; IEA.

InterPro; IPR008161; Cull helix.

InterPro; IPR008161; Cullagen.

Pfam; PF01410; CCLFI, II.

Pfam; PF01391; Collagen; 18.

Probom; PF0002078; Fib_collagen_C; I.

SMART; SM00038; COLFI_C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-NOV1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-UNY-2003 (TrEMBLrel. 24, Last annotation update)
Type II collagen.
Type II collagen.
Eduus caballus (Horse).
Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi;
Mammalia, Eutheria, Perissodactyla, Equidae, Equus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 941; DB 13; Length 1447;
Pred. No. 2e-57;
8; Mismatches 25; Indels 14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1447 AA; 137446 MW; A4A6DD2B4158E38B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
Richardson D.W., Dodge G.R.;
Submitted (JUN-1996) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 18-68 FROM N.A.
MacLeod J.W., Fubini S.L., Gu D.N., Terreault J.W., Todl
Submitted (DEC-1997) to the EMBL/GenBank/DDBJ databases
EMBL; U62528; AABO5773.1; -.
EMBL; AF040638; AAB96768.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    170 SPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT; 1418 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  79.5%;
                                                                                                                                                                                                                                                                                                                                                                                                            PROSITE, PS01208; VWFC_1; 1.
PROSITE; PS50184; VWFC_2; 1.
COllagen. 1447 AA; 137446 |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 79.5
Best Local Similarity 78.5
Matches 172; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=9796;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q28396
             ठ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          THE PRINCE OF TH
```

ö

```
SEQUENCE FROM N.A.
                                                                                                        NCBI_TaxID=9031;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=9031;
                                                                                                                                                                                                     NON TER
SEQUENCE
                                                                                                                                                                                           Collagen.
                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                      454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Q90W37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 13
Q90W37
 à
                                                                                                                                                                                                                                                                                                           유
                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                       d
                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                      Б
                                                                                                                                                                                                                                                                                                                                                                                                                               ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                    원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
                         GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                               611
                                                                      GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                             671
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   543 GEPGKAGEKGLPGAPGLRGLPGKDGETGAAGPPGPAGPAGERGEOGAPGPSGFOGLPGPP 602
492 GARGEPGGAGPVGPPGERGAPGNRGFPGQDGLAGPKGAPGERGPSGLAGPKGANGDPGRP 551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                    612 GEPGKAGEKGLPGAPGLRGLPGKDGETGAAGPPGPAGPAGERGEGGAPGPSGFQGLPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                               Baldwin C.T., Reginate A.M., Smith C., Jimenez S.A., Prockop D.J.;
"Structure of cDNA clones coding for human type II procollagen. The
alpha 1(II) chain is more smilar to the alpha 1(I) chain than two
other alpha chains of fibrillar collagens.";
Biochem. J. 262:521-528(1989).
Biochem. J. 262:521-528(1989).
InterPro; IPR008161; Callagen.
                                                                                                                                                                                                                                                                                 Bukaryota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi;
Mammalia; Butheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         72.6%; Score 859; DB 4; Length 1160;
llarity 74.0%; Pred. No. 7.7e-52;
Conservative 10; Mismatches 44; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                113 >160 COLLAGEN.
113 -1160 COLLAGEN.
1160 1160 MW; A7F0523B856C8639 CRC64;
                                                                                                                                                                                                                       01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-JUN-2003 (TrEMBLrel. 24, Last annotation update)
COL2A1 protein precursor (Fragment).
                                                                                                                                                                                                     PRT; 1160 AA.
                                                                                                                   GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                           GPPGEGGKPGDOGVPGEAGAPGLVGPRG 699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPPGEGGKPGDQGVPGEAGAPGLVGPRG 630
                                                                                                                                                                                                                                                                                                                                                        TISSUE=Cartilage;
MEDLINE=90026318; PubMed=2803268;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pfam; PF01391; Collagen; 18.
Probom; PD000007; Clg_helix; 4.
Collagen; Signal. 23 PO
SIGNAL
                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local Simi
nes 154;
                                                                                                                   181
                                              552
                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NON TER
SEQUENCE
                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        603
                                                                                                                                                                                                                014046;
                                                                                                                                                                                       Q14046
ID Q14046
                                                                                                                                                                                                                                                                          COL2AL
                                                                                                                                                                             RESULT 11
                                          ВÞ
                                                                                         g
                                                                                                                                                                                                      ò
                                                                   ò
                                                                                                                   8
                                                                                                                                         원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
```

PRT; 1269 AA

PRELIMINARY;

Q7T2Z7 Q7T2Z7;

RESULT 12 Q7T2Z7

```
333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GEAGLPGAKGLIGSPGSPGPDGKIGPPGPAGQDGRPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPPGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 394 GEPGKAGEKGLPGAPGLRGLPGKDGETGAAGPPGPAGPVGERGEQGAPGPSGFQGLPGPP 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A Caixia X., Yongzhi X., Siqi G., Yiying S.;
A Caixia X., Yongzhi X., Siqi G., Yiying S.;
A Caixia X., Yongzhi X., Siqi G., Yiying S.;
Submitted (JUL-2001) to the EMBL/GenBank/DDBJ databases.
R GO, GO.0005201; F.extracellular matrix structural constituent; IEA.
R GO, GO.0005201; F.extracellular matrix structural constituent; IEA.
R InterPro; IPRO08161; Clalagen.
R InterPro; IPRO0885; Fib_collagen_C.
R Pfam; PF01410; Collagen.
R Pfam; PF01410; Collagen; 18.
R Pfam; PF01410; Collagen; 18.
R Probom; PD000007; Clg_helix; 6.
R PRODOM; PR000078; Fib_collagen_C; 1.
SWART; SW00038; COLFI; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       274 GARGEPGAAGPVGPPGERGAPGNRGFPGQDGLAGPKGAPGERGPAGLAGPKGATGDPGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                            Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Archosauria, Aves, Neognathae, Galliformes, Phasianidae, Phasianinae,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gallus gallus (Chicken).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
Caixta X., Yongzhi X., Siqi G., Yuying S.;
"Gallus gallus alpha I type IIA collagen precursor (CCL2A1).";
Submitted (JUN-2003) to the EMBL/GenBank/DDBJ databases.
EMBL; AF452711; AA033039.2; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ouery Match 72.6%; Score 859; DB 13; Length 1269; Best Local Similarity 73.6%; Pred. No. 8.4e-52; Matches 153; Conservative 11; Mismatches 44; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                1
1269 AA; 120116 MW; 446EF91BEBEBBF6A CRC64;
01-OCT-2003 (TrEMBLrel. 25, Created)
01-OCT-2003 (TrEMBLrel. 25, Last sequence update)
01-OCT-2003 (TrEMBLrel. 25, Last annotation update)
Alpha 1 type II procollagen (Fragment).
COL2A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-OCT-2003 (TrEMBLrel. 25, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT; 1420 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Alpha 1 type IIA collagen precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                        Gallus gallus (Chicken)
```

ö

```
091717;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   091717
                                                                    Kang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 15
  임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ଟ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                              GEAGLPGAKGLTGSPGSPGRDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                      485 GEPGLPGARGLIGRPGDAGPQGKVGPTGAPGEDGRPGPPGQARGQPGWMGFPGPKGAN 544
                                                                                                                                                                                                                                                                                                                                   GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                             545 GEPGKAGEKGLPGAPGLPGKDGETGAAGPPGPAGPVGERGEQGAPGPSGFQGLPGPP 604
                                                                                                                                                                                                 425 GARGEPGAAGPVGPPGERGAPGNRGFPGQDGLAGPKGAPGERGPAGLAGPKGATGDPGRP 484
                                                                                                                                                       1 GPPGEPGPTGLPGPPGERGGPGSRGPPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TISSUE=Blood;
MEDINE=SILSH1; PubMed=2081599;
MEDINE=SILSH2811 PubMed=2081599;
Syan M.C., Sieraski M., Sandell L.J.;
"The human type II procollagen gene: identification of an additional proteath-codding domain and location of potential regulatory sequences in the promoter and first intron.";
Genomics 8:41-48(1990).
                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Baldwin C.T., Reginato A.M., Smith C., Jimenez S.A., Prockop D.J., "Structure of cDNA clones coding for human type II procollagen. The alpha 1(II) chain is more similar to the alpha 1(I) chain than two other alpha chains of fibrillar collagens."; Biochem. J. 262:521-528(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TISSUE=Blood;
MEDINE=BR190534; PubMed=3857598;
Cheah K.S., Sroker N.G., Griffin J.R., Grosveld F.G., Solomon E.;
"Identification and characterization of the human type II collagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Buteleostomi,
Mammalia, Eutheria, Primates, Catarrhini, Hominidae, Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Vikkula M., Peltonen L.; "Structural analyses of the polymorphic area in type II collagen
                                                                                                            ö
                                                                  Length 1420;
                                                                                                            44; Indels
25 POTENTIAL.
134999 MW; 88D9AAB17F214FF5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gene (COL2A1).";
Proc. Natl. Acad. Sci. U.S.A. 82:2555-2559(1985).
                                                           72.6%; Score 859; DB 13;
73.6%; Pred. No. 9.3e-52;
.ive 11; Mismatches 44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT; 1487 AA
                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                     605 GPPGESGKPGDQGVPGEAGAPGLVGPRG 632
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=90026318; PubMed=2803268;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=89325561; PubMed=2753125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-NOV-1996 (TrEMBLrel. 01, Cr
01-NOV-1996 (TrEMBLrel. 01, La
01-UN-2003 (TrEMBLrel. 24, La
Alpha-1 type II collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gene.";
FEBS Lett. 250:171-174(1989).
                                                                                       Best Local Similarity 73.6
Matches 153; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Homo sapiens (Human).
                  1420 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                [5]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxiD=9606;
SIGNAL
SEQUENCE
                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  014047
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 14

104047

104047

104047

104047

104047

104047

1010404

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

10107

1010
                                                                                                                                                                                                 엄
                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                              a
a
                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                              ठ
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=97104294; PubMed=8948452; Ala-Kokko L., Kvist A.P., Metsaranta M., Kivirikko K.I., Ala-Kokko L., Kvist A.P., Metsaranta M., Kivirikko K.I., Ce Crombrugghe B., Prockop D.J., Vuorio E., Vuorio E., Ce Crombrughe B., Prockop D.J., Vuorio E., Ce Combron C. the binding of common transcription factors in the human and mouse genes for type II procollagen (COL2AI)."; Biochem. J. 308:0-0(0).

EMBL, L10347; AAC41772.1; -...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 GPPGEPGPTGLPGPPGERGCPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                     "Structural analysis of the regulatory elements of the type-II procollagen gene. Conservation of promoter and first intron sequences between human and mouse.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        492 GARGEPGGVGPIGPPGERGAPGNGFPGQDGLAGPKGAPGERGPSGLAGPKGANGDPGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                            "Genomic organization of the human procollagen alpha 1(II) collagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GO; GO:0005581; C:collagen, IEA.
GO; GO:0005201; F:extracellular matrix structural constituent; IEA.
InterPro; IPR008161; Clg.helix.
InterPro; IPR008160; Clolagen.
InterPro; IPR00885; Fib.collagen.
InterPro; IPR001077; VWF_C.
MEDLINE-91153296; PubMed-1999183;
Huang M.C., Seyer J.M., Thompson J.P., Spinella D.G., Cheah K.S.,
                                                                                                                                                                                                                                                                  MEDLINE=92344585;
Vikkula M., Metsaranta M., Syvanen A.C., Ala-Kokko L., Vuorio E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   44; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1487 AA; 141772 MW; 0B7E79D46BDAFA97 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (TrEMBLrel. 01, Created)
(TrEMBLrel. 01, Last sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
72.6%; Score 859; DB 4;
Best Local Similarity 74.0%; Pred. No. 9.6e-52;
Matches 154; Conservative 10; Mismatches 44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT; 1486 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              672 GPPGEGGKPGDQGVPGEAGAPGLVGPRG 699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfan, PF01410; COLFI; 1.
Pfan, PF01391; Collagen; 18.
ProDom; PF000007; Clg_helix; 4.
ProDom; PF000007; Clg_helix; 4.
SWART; SW00038; CoLFI; 1.
SWART; SW00214; VWC; 1.
                                                                                                                              gene.";
Eur. J. Biochem. 195:593-600(1991)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PROSITE; PS01208; VWFC_1; 1.
PROSITE; PS50184; VWFC_2; 1.
COLLagen. 1487 AA; 141772 ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                           Biochem. J. 285:0-0(0)
                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TISSUE=Blood;
                                                                                                                                                                                                                                         TISSUE=Blood;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-NOV-1996
01-NOV-1996
                                                                                                                                                                                                                                                                                                                                  Peltonen L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
```

```
S. S. WEDLINE-92011898; PubMed=1918153; S. WEDLINE-92011898; PubMed=1918153; S. W. WEDLINE-92011898; PubMed=1918153; S. W. WEDLINE-92011898; PubMed=1918153; S. W. WEDLINE-92011898; PubMed=10.1.15. Revise embryogenesis is characterized by stage-specific production of alternatively spliced transcripts."; Call Biol. 15:565-575(1991).

R. Call Biol. 15:565-575(1991).

R. M. Sabses, AA40333.

P. R. BA4033; A40333.

P. R. BA4033; BA4033.

R. Collagen; Cicollagen; IEA.

GO; GO:0005201; F:extracellular matrix structural constituent; IEA.

InterPro: IPR0008161; Collagen.

R. InterPro: IPR0008161; Collagen.

R. InterPro: IPR0008161; Collagen.

R. R. PERDEN, PRO10391; Collagen.

R. Pfam; PR010391; Collagen; 18.

R. ProDom; PD00007; Clg_helix; 4.

R. ProDom; PD00007; Clg_helix; 4.

R. ROSITE; SM00214; VWFC.1; 1.

R. ROSITE; PS01208; VWFC.1; 1.

R. ROSITE; PS01208; VWFC.1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          494 GARGEPGAAGPNGPPGERGAPGNRGFPGQDGLAGPKGAPGERGVPGLGGPKGGNGDPGRP 553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      554 GEPGLPGARGLTGRPGDAGPQGKVGPSGASGEDGRPGPPGPQGARGQPGVMGFPGPKGAN 613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  614 GEPGKAGEKGLVGAPGLRGLPGKDGETGSQGPNGPAGPAGERGEOGPPGPSGFQGLPGPP 673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0; Gaps
                                                 Xenopus laevis (African clawed frog).

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Amphibia; Batrachia; Anura; Mesobatrachia; Pipoidea; Pipidae;
Xenopodinae; Xenopus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 71.8%; Score 850; DB 13; Length 1486; Best Local Similarity 73.1%; Pred. No. 4e-51; Matches 152; Conservative 11; Mismatches 45; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Collagen.
SEQUENCE 1486 AA; 142263 MW; 4A4A95772341042F CRC64;
01-OCT-2003 (TrEMBLrel. 25, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Search completed: September 24, 2004, 11:11:12 Job time : 24.0943 secs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
```

Sequence 143, Applications of the property of

```
49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVMGFPGPRGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGFAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 GPP------GEPGPIGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 97.0%; Score 1149; DB 12; Length 501; Best Local Similarity 93.6%; Pred. No. 7.5e-59; Matches 206; Conservative 0; Mismatches 2; Indels 12.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 17, Application US/10232175

Publication No. US20030064074A1

GENERAL INFORMATION:

APPLICANT: Chang, Robert C.

APPLICANT: Kivitikko, Kari I.

APPLICANT: Neff, Thomas B.

APPLICANT: Olsen, David R.

APPLICANT: Olsen, James W.

TITLE OF INVENTION: RECOMBINANT GELATINS IN VACCINES

FILE REPERENCE: FG0224

CURRENT FILING DATE: 2002-08-30

PRIOR APPLICATION NUMBER: US/09/710,249

PRIOR PILING DATE: 2000-11-10

NUMBER OF SEQ ID NOS: 33

SOFTWARE: PATENTIN Ver. 2.0

TENGTRANT: PATENTIN Ver. 2.0
US-10-201-822-28

US-10-291-265-243

US-10-291-265-243

US-10-734-864-19

US-10-702-072A-8

US-10-402-072A-8

US-10-402-072A-2

US-10-402-072A-2

US-10-402-072A-2

US-10-342-331-49

US-10-342-331-49

US-10-342-331-86

US-10-468-091-26

US-10-68-091-26

US-10-68-091-26

US-10-68-091-26

US-10-194-441A-1

US-10-231-885-44

US-10-231-885-44

US-10-231-885-44

US-10-231-885-44

US-10-231-885-44

US-10-231-175-20

US-10-232-175-21

US-10-232-175-22

US-10-232-175-22

US-10-232-175-22

US-10-232-175-22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-10-402-072A-12
US-10-177-293-70
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ALIGNMENTS
    LENGTH: 501
TYPE: PRT
ORGANISM: human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -10-232-175-17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-10-232-175-17
                                                11149
111449
1111444
111141
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
11116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
1116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109
    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11, Appl
6, Appli
18, Appli
10, Appl
10, Appl
261, Appl
159, App
36, Appl
36, Appl
21, Appl
36, Appl
36, Appl
65, Appl
                                                                                                                                                          September 24, 2004, 11:07:31 ; Search time 25:8127 Seconds (without alignments) 2603.588 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 17, A sequence 16, A sequence 11, A Sequence 17, A Sequence 10, A Sequence 10, A Sequence 36, A Sequence 36, A Sequence 31, A Sequence 55, A Sequence 65, A Sequen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                    US-10-658-989A-1
1184
1 GPPGEPGPTGLPGPPGERGG........GBQGVPGDLGAPGPSGPAGG 209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1. / cgn2_6/ptcdata/1/pubpaa/USO7_PUBCOMB.pep:*
2. / cgn2_6/ptcdata/1/pubpaa/USO7_NEW_PUB.pep:*
3. / cgn2_6/ptcdata/1/pubpaa/USO6_NEW_PUB.pep:*
3. / cgn2_6/ptcdata/1/pubpaa/USO6_NEW_PUB.pep:*
5. / cgn2_6/ptcdata/1/pubpaa/USO7_NEW_PUB.pep:*
6. / cgn2_6/ptcdata/1/pubpaa/USO7_NEW_PUB.pep:*
7. / cgn2_6/ptcdata/1/pubpaa/USO8_NEW_PUB.pep:*
8. / cgn2_6/ptcdata/1/pubpaa/USO8_PUBCOMB.pep:*
9. / cgn2_6/ptcdata/1/pubpaa/USO8_PUBCOMB.pep:*
10. / cgn2_6/ptcdata/1/pubpaa/USO9_PUBCOMB.pep:*
11. / cgn2_6/ptcdata/1/pubpaa/USO9_NEW_PUB.pep:*
12. / cgn2_6/ptcdata/1/pubpaa/USO9_NEW_PUB.pep:*
13. / cgn2_6/ptcdata/1/pubpaa/USO9_PUBCOMB.pep:*
14. / cgn2_6/ptcdata/1/pubpaa/USO9_PUBCOMB.pep:*
15. / cgn2_6/ptcdata/1/pubpaa/USO9_PUBCOMB.pep:*
16. / cgn2_6/ptcdata/1/pubpaa/USO0_PUBCOMB.pep:*
17. / cgn2_6/ptcdata/1/pubpaa/USO0_PUBCOMB.pep:*
18. / cgn2_6/ptcdata/1/pubpaa/USO0_NEW_PUB.pep:*
19. / cgn2_6/ptcdata/1/pubpaa/USO0_NEW_PUB.pep:*
17. / cgn2_6/ptcdata/1/pubpaa/USO0_NEW_PUB.pep:*
18. / cgn2_6/ptcdata/1/pubpaa/USO0_NEW_PUB.pep:*
                          GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-10-232-175-17
US-10-104-889-16
US-10-104-889-11
US-10-104-889-11
US-10-104-889-8
US-10-104-889-8
US-10-104-889-10
US-10-104-889-10
US-10-104-889-10
US-10-104-889-10
US-10-104-889-10
US-10-104-889-10
US-10-104-889-10
US-10-104-889-10
US-10-104-11-31
US-10-104-11-36
US-10-1149-352-2
US-10-1149-352-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                 1349238 segs, 321558718 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Published_Applications_AA:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                 - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                             BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          seq length: 0
seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Minimum DB
Maximum DB
                                                                                                                    OM protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Database :
                                                                                                                                                                                                                                                                                                    Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 111111
124200012840
                                                                                                                                                               Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Result
```

ij,

12;

48

```
RESULT 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         168
400 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               117 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAGGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97.0%; Score 1149; DB 16; Length 1057; 93.6%; Pred. No. 1.4e-58; tive 0; Mismatches 2; Indels 12;
                                                                                                                                       RESULT 2
US-104-889-16
US-104-04-889-16
Sequence 16, Application US/10104889
Sequence 16, Application US/10104889
Sequence 16, Application No. US20040086961A1
GENERAL INFORMATION:
APPLICANT: GRUSKIN, BILLIOT A.
BROCKAW, JANE
ZHANG, GUANGHUI
PAOLELLA, DAVID
TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
NUMBER OF SEQUENCES: 50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COUNTRY: U.S.A.
ZIP: 11553
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: IBM PC compatible
COMPUTER: SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                              460 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 516
                                        169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE: DILWORTH & BARRESE
STREET: 333 EARLE OVINGTON BOULEVARD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/10/104,889
FILING DATE: 22-Mar-2002
CLASSIFICATION: CURROWN:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/09/169,768
ATTORNEY/AGENT TRORMATION:
NAME: STEEN, JEFFREY S
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TOPOLOGY: unknown
MOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO: 16:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELEPHONE: (516) 228-8484
TELEFAX: (516) 228-8516
INFORMATION FOR SEQ ID NO: 16:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LENGTH: 1057 amino acids TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity 93.6;
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                            CITY: UNIONDALE STATE: NY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-10-104-889-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               477
셤
                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Dp
                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
```

```
ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGAKGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 GPP-------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1057;
                                                                                                                                                                             PAOLELLA, DAVID
PAOLELLA, DAVID

ITTLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
CORRESPONDENCE ADDRESS:
ADDRESSEE: DILMORTH & BARRESE
STREET: 333 EARLE OVINGTON BOULEVARD
CITY: UNIONDALE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     477 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 97.0%; Score 1149; DB 16; Best Local Similarity 93.6%; Pred. No. 1.4e-58; Matches 206; Conservative 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION DATA.

APPLICATION NUMBER: US/10/104,889
FILING DATE: 22-Mar-2002
CLASSIFICATION: «Unknown»
PRIOR APPLICATION NUMBER: US/09/169,768
FILING DATE: 09-OCT-1998
ATTORNEY/AGENT INFORMATION:
NAME: STEEN, USFREY S
TELECOMMUNICATION INFORMATION:
TELEPHONE: (S16) 228-8484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; TOPOLOGY: unknown
; MOLECULE TYPE: peptide
; SEQUENCE DESCRIPTION: SEQ ID NO: 20:
US-10-104-889-20
Sequence 20, Application US/10104889
Publication No. US20040086961A1
GENERAL INFORMATION:
BUCKTIEN, ELLIOT A.
BUCKTIEN, DOUGLAS
BROKAW, JANE
ZHANG, GUANGHUI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-10-104-889-11
; Sequence 11, Application US/10104889
; Publication No. US20040086961A1
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH: 1057 amino acids
                                                                                                                                                                                                                                                                                                                                                        STATE: NY
COUNTRY: U.S.A.
ZIP: 1153
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEFAX: (516) 228-8
INFORMATION FOR SEQ ID NO: 20:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TYPE: amino acid
```

```
Sequence 8, Application US/10104889;
Sequence 8, Application US/10104889;
Publication No. US20040086961A1
GENERAL INFORMATION:
BUECHTER, DOUGLAS
BROCKAW, JANE
TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
NUMBER OF SEQUENCES:
CORRESPONDENCE ADDRESS:
CORRESPONDENCE ADDRESS:
STREET: 333 SARLE OVINGTON BOULEVARD
CITY: UNINDBALE
STATE: NY
STATE: NY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   477 GSPGFÇGLPGPAGPPGEAGKPGEÇGVPGDLGAPGPSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match 97.0%; Score 1149; DB 16;.
Best Local Similarity 93.6%; Pred. No. 1.5e-58;
Matches 206; Conservative 0; Mismatches 2;
                                                   ADDRESSEE: DILWORTH & BARRESE
STREET: 333 EARLE OVINGTON BOULEVARD
CITY: UNIONDALE
STATE: NY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY: unknown
MOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO: 6:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-10-104-889-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-10-104-889-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKIGPPGPAGQDGRPGPPGPPGARGQA 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     417 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 1107;
                                                                                                                                                                                                                                                                                    COMPUTER READBLE FORM:

MEDIUM TYPE: Floppy disk
COMPUTER: Floppy disk
COMPUTER: Floppy disk
COMPUTER: Floppy disk
COMPUTER: IEM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CUBRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/169,768
FILING DATE: 22-Mar-2002
CLASSIFICATION NUMBER: US/09/169,768
FILING DATE: 09-OCT-1998
ATTONACY/AGENI INFORMATION:
TELEPHONE: (516) 228-8484
TELEPHONE: (516) 228-8484
TELEPHONE: (516) 228-8484
TELEPHONE: (516) 228-8484
INFORMATION FOR SEQ ID NO: 11:
SEQUENCE CHARACTERISTICS:
LENGTH: 1107 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
APPLICANT: GRUSKIN, ELLIOT A.
BUECHTER, DOUGLAS
BROKAW, JANE
EROKAW, JANE
ZHANG, GUANGHUI
PAOLELLA, DAVID
TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2; Indels
APPLICANT: GRUSKIN, ELLIOT A.
BUECHTER, DOUGLAS
BROKAW, JANE
ZHANG, GUANGHUI
PACLELLA, DAVID
TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
NUMBER OF SEQUENCES: 50
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             477 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ouery Match 97.0%; Score 1149; DB 16
Best Local Similarity 93.6%; Pred. No. 1.4e-58;
Matches 206; Conservative 0; Mismatches 2
                                                                                                                                                                                       ADDRESSEE: DILWORTH & BARRESE
STREET: 333 EARLE OVINGTON BOULEVARD
CITY: UNIONDALE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRANDEDNESS: single
TOPOLOGY: unknown
MOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO: 11:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 6, Application US/10104889
Publication No. US20040086961A1
                                                                                                                                                                                                                                                         STATE: NY
COUNTRY: U.S.A.
ZIP: 11553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-10-104-889-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-10-104-889-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d
```

```
297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGFAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1169;
COUNTRIES COMPUTED I 1553
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
CONFUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PATENCATION DATA:
APPLICATION NUMBER: US/10/104,889
FILING DATE: 22-Mar-2002
CLASSIFICATION NUMBER: US/09/169,768
FILING DATE: 09-OCT-1998
ATTOMATION PORMATION:
NAME: STEEN, UEFFREY S
TELEPHONE: (516) 228-8484
TELEPHONE: (516) 228-8516
INFORMATION FOR REQ ID NO: 6:
SEQUENCE CHARACTERISTICS:
SEQUENCE CHARACTERISTICS:
SEGUENCE CHARACTERISTICS:
"TOTAL TOTAL TO
```

```
49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   394 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGFDGKIGPPGPAGQDGRPGPPGPFGARGQA 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1341;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES NUMBER OF SEQUENCES: 50
CORRESPONDENCE ADDRESS:
ADDRESSEE: DILWORTH & BARRESE STREET: 33 BARLE OVINGTON BOULEVARD CITY: UNIONDALE STATE: NY
COUNTRY: U.S.A.
ZIP: 11553
COMPUTER READABLE PORM:
MEDIUM TYPE: Floppy disk
SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    514 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ouery Match 97.0%; Score 1149; DB 14; Best Local Similarity 93.6%; Pred. No. 1.7e-58; Matches 206; Conservative 0; Mismatches 2;
                                                                                                 PRIOR APPLICATION DATA:

APPLICATION NUMBER: 09/570,573
FILING DATE: 2002-MAY-12
APPLICATION NUMBER: 08/187,319
FILING DATE: 4DAGNOWN
NAME: 60GOTIS. 4DAGNOWN
NAME: 60GOTIS. 40GOTIS.
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION 12-527-7700
TELECOMMUNICATION 12-527-7700
TELECOMMUNICATION 18:
SEQUENCE CHARACTERISTICS:
LENGTH 1341 amino acids
                                           APPLICATION NUMBER: US/10/058,124
FILING DATE: 29-Jan-2002
CLASSIFICATION: <UNKNOWN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CLONE: COLLAGEN ALPHA 1 (1)
SEQUENCE DESCRIPTION: SEQ ID NO: 18:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 8
US-104-889-10
; Sequence 10, Application US/10104889
; Publication No. US20040086961A1
; GENERAL INFORMATION:
; APPLICANT: GRUSKIN, ELLIOT A.
; BURCHER, DOUGLAS
; BROKAW, JANE
; APPLICANT: A.
; BROKAW, JANE
; BROKAW, JANE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM: Homo sapiens IMMEDIATE SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TOPOLOGY: linear
MOLECULE TYPE: protein
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-10-058-124-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AD INFORMATION.

APPLICANT: QVist, Per
Bonde, Martin
TITLE OF INVENTION: A Method for Assaying Collagen Fragments
in Body Fluids, A Test Kit and Means for Carrying Out the
Method and Use of the Method to Diagnose the Presence of
Disorders Associated with the Metabolism of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         49 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    417 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 1171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2; Indels
                                                                MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NAMBER: US/10/104,889
FILING DATE: 22-Mar-2002
CLASSIFICATION: <UNKNOWN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      477 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169 GSPGFQGLPGPAGPPGBAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 97.0%; Score 1149; DB 16; Best Local Similarity 93.6%; Pred. No. 1.5e-58; Matches 206; Conservative 0; Mismatches 2;
                                                                                                                                                                                                                                                                                   APPLICATION DAIR

APPLICATION NUMBER: US/09/169,768

FILING DATE: 09-0CT-1998

ATTORNEY/AGENT INFORMATION:
NAME: STEEN, JEFFREY S

TELECOMMUNICATION INFORMATION:
TELEPHONE: (516) 228-6484

TELEFAX: (516) 228-6484

INFORMATION FOR SEQ ID NO: 8:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY: USA
ZIP: 10022
COMPUTER READABLE FORM:
MADDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7 TOPOLOGY: unknown ; MOLECULE TYPE: peptide ; SEQUENCE DESCRIPTION: SEQ ID NO: 8: US-10-104-889-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CORRESPONDENCE ADDRESS:
ADDRESSEE: Darby & Darby PC
STREET: 805 Third Avenue
CITY: New York
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 18, Application US/10058124; Publication No. US20030119058A1; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH: 1171 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: amino acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
                       ZIP: 11553
COMPUTER READABLE FORM:
  COUNTRY: U.S.A.
```

В ò Db

Db ò

ò

```
109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       578 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPA 637
                                                                                                                                                                                                                                                                                   515 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 574
                                                                                                                                                                                                                                               109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                          155 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                   49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1464;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 10
US-09-18-715-261
US-09-18-715-261
Sequence 261, Application US/09918715
Sequence 261, Application US/09918715
Sequence 261, Application US/09918715
Sequence 261, Application No. US20030017157A1
GENERAL INFORMATION:
APPLICANT: Brad St. Croix
APPLICANT: Renneth Kinzler
TITLE OF INVENTION: ENDOFFELIAL CELL EXPRESSION PATTERNS
FILE REFERENCE: 1107.00134
CURRENT FILING DATE: 2001-08-01
PRIOR APPLICATION NUMBER: 60/225,599
PRIOR PILING DATE: 2000-08-01
PRIOR FILING DATE: 2000-08-11
PRIOR FILING DATE: 2000-08-11
PRIOR FILING DATE: 2000-08-11
SPRIOR FILING DATE: 2000-08-11
SPRIOR FILING DATE: 2000-08-11
SPRIOR FILING DATE: 2000-04-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                 635 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         638 GSPGFQGLPGPPGBAGKPGBQGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                             169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match 97.0%; Score 1149; DB 12; Best Local Similarity 93.6%; Pred. No. 1.8e-58; Matches 206; Conservative 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-10-060-036-159

// Sequence 159, Application US/10060036

// Sequence 159, Application US/10060036

// GENERAL INFORMATION:
// APPLICANT: Benson, Darin R.
// APPLICANT: Kalos, Michael D.
// APPLICANT: Lodes, Michael J.
// APPLICANT: Hepler, Milliam T.
// APPLICANT: Hepler, William T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; TYPE: PRT
; ORGANISM: Homo sapiens
US-09-918-715-261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                      g
                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGSPA 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGFDGKTGPPGPAGQDGRPGPPGPRGQA 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         417 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAGGPPGPAGPAGFAGERGEQGPA 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----GEPGFTGLPGPFGERGGFGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 9

US-10-468-091-25

Sequence 25, Application US/10468091

Publication No. US200401573291

GENERAL INFORMATION:

APPLICANT: ADP Pharmaceutical Pty Limited

APPLICANT: THE UNIVERSITY of Sydney

TILLE OF INVENTION: Matrix gene expression in chondrogenesis

TILLE OF INVENTION: MATRIX Gene expression in chondrogenesis

CURRENT FILING DATE: 2003-08-13

PRIOR APPLICATION NUMBER: US/10/468,091

CURRENT FILING DATE: 2003-08-15

NUMBER OF SEQ ID NOS: 42

NUMBER OF SEQ ID NOS: 42

SEQ ID NO 25

IENGTH: 1461

TYPE: PRT

CREANIENT Homo sapiens

US-10-468-091-25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DB 16; Length 1461;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 97.0%; Score 1149; DB 16; Length 1388; Best Local Similarity 93.6%; Pred. No. 1.7e-58; Matches 206; Conservative 0; Mismatches 2; Indels 12;
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/10/104,889
FILING DATE: 22-Mar-2002
CLASSIFICATION: <UNKnown>
PRIOR APPLICATION NUMBER: US/09/169,768
FILING DATE: 09-OCT-1998
ATTORION DATA:
TELERATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELEPHONE: (516) 228-8484
TELECOMMUNICATION INFORMATION:
TELEPHONE: (516) 228-8484
TELERATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE CHARACTERISTICS:
TYPE: amino acids
TYPE: amino acids
TYPE: amino acids
TYPE: amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSPGFÇGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match . 97.0%; Score 1149; DB 16
Best Local Similarity 93.6%; Pred. No. 1.8e-58;
Matches 206; Conservative 0; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: unknown
MOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO: 10:
US-10-104-889-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ð
```

ï

12;

517 108 577

ø

```
458 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; ORGANISM: Homo sapiens
US-10-216-705-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LENGTH: 1464
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                     US-10-216-705-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 14
US-10-149-352-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQ ID NO 21
                                                                                                                                                                                                                                              169
                                                                                            g
                                                                                                                                                                                         셤
                                                    8
                                                                                                                                                 ò
                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ठ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \overset{\diamond}{\circ}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: NOVEL GENES, COMPOSITIONS, KITS, AND METHODS FOR TITLE OF INVENTION: NOVEL GENES, COMPOSITIONS, KITS, AND METHODS FOR TITLE OF INVENTION: DENTIFICATION, ASSESSMENT, PREVENTION, AND THERAPY TITLE OF INVENTION: OF CERVICAL CANCER FILE REFERENCE: MRI-035 CURRENT APPLICATION NUMBER: US/10/17,311 CURRENT FILING DATE: 2002-06-12 PRIOR PELICATION NUMBER: US 60/298,159 PRIOR APPLICATION NUMBER: US 60/298,155 PRIOR APPLICATION NUMBER: US 60/298,155 PRIOR APPLICATION NUMBER: US 60/298,155 PRIOR PILING DATE: 2001-06-13 PRIOR PILING DATE: 2001-06-13 PRIOR FILING DATE: 2001-11-14 SOFTWARE: PSECS for Windows Version 4.0 SEQ ID NOS: 238 LENGTH: 1464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                           517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   49 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKIGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           578 GVMGPPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                                                                                                                                                                                                                                                                                                                                                                                                       518 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARQQA
                                                                                                                                                                                                                                                                                                                                                                                                         1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                               2; Indels 12;
                                                                                                                                                                                                                                                                                                               Query Match 97.0%; Score 1149; DB 14; Length 1464; Best Local Similarity 93.6%; Pred. No. 1.8e-58; Matches 206; Conservative 0; Mismatches 2; Indels 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 1464;
TITLE OF INVENTION: COMPOSITIONS AND METHODS FOR THE THERAPY TITLE OF INVENTION: AND DIAGNOSIS OF PANCREATIC CANCER FILE REFERENCE: 210.121.566
CURRENT APPLICATION NUMBER: US/10/060,036
CURRENT FILING DATE: 2002-01-30
NUMBER OF SEQ ID NOS: 4560
SOFTWARE: FASTSEQ for Windows Version 4.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         638 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ouery Match 97.0%; Score 1149; DB 14;
Best Local Similarity 93.6%; Pred. No. 1.8e-58;
Matches 206; Conservative 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 36, Application US/10171311 Publication No. US20030087270A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Schlegel, Robert
APPLICANT: Chen, Yan
APPLICANT: Monahan, Yohn
APPLICANT: Monahan, John
APPLICANT: Kamatkar, Shubhangi
APPLICANT: Gannayarapu, Manjula
                                                                                                                                                                                                                                      ; ORGANISM: Homo sapiens
US-10-060-036-159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM: Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JS-10-171-311-36
                                                                                                                                                                  SEQ ID NO 159
                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \stackrel{>}{\circ}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            дD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
```

```
Sequence 21, Application US/10216705
Sequence 21, Application US/10216705
Publication No. US20030096973A1
GENERAL INFORMATION:
APPLICANT: Meristem Therapeutics, S.A.
TITLE OF INVENTION: Recombinant Collagens and Derived Proteins Produced by Plants, Met
TITLE OF INVENTION: Obtaining Such and Their Uses
TITLE OF INVENTION: Obtaining Such and Their Uses
TITLE OF INVENTION: UNMBER: US/10/216,705
CURRENT FILING DATE: 2002-08-09
FRICA PAPLICATION NUMBER: US 09/331,347
FRICA PAPLICATION UNMBER: US 09/331,347
FRICA PAPLICATION UNMS. 22
SOFTWARE PALENT OF SEQ ID NOS: 22
SOFTWARE PARENT PAPLICATION OF SEQ ID NOS: 22
SOFTWARE PARENT PAPLICATION OF SEQ ID NOS: 22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7
.49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                             109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                    578 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 637
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              48
                                                           518 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               518 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GPP-----GEPGFTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 458 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                       GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                      638 GSPGFOGLPGPAGPPGBAGKPGBOGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               638 GSPGFQGLPGFAGPPGEAGKPGEQGVPGDLGAPGFSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 1149; DB 14
Pred. No. 1.8e-58;
0; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: BETT, Rajinder
TITLE OF INVENTION: ANTERNSE CLIGONUCLECTIDES
FILE REFERENCE: 06275-2540S1
CURRENT APPLICATION NUMBER: US/10/149,352
CURRENT FILING DATE: 2002-06-10
PRIOR APPLICATION NUMBER: PCT/GB00/04741
PRIOR FILING DATE: 2000-12-12
PRIOR FILING DATE: 1999-12-15
PRIOR PLING DATE: 1999-12-15
NUMBER OF SEQ ID NOS: 14
SOFTWARE: Patentin Ver. 4.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 2, Application US/10149352
Publication No. US20030105050A1
GENERAL INFORMATION:
```

517

48

Gaps

12;

```
518 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARQQA 577
                                                                                                                                                                                                                                                                                                                                                                                               458 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGFKGPAGERGSPGPA
                                                                                                                                                                                                                                                        49 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                    1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                            Query Match 97.0%; Score 1149; DB 14; Length 1464; Best Local Similarity 93.6%; Pred. No. 1.8e-58; Matches 206; Conservative 0; Mismatches 2; Indels 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   638 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Search completed: September 24, 2004, 11:13:23 Job time : 26.8127 secs
US-10-177-293-65
                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                   ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Meyers, Kachest E.
APPLICANT: Bast Jr., Robert C.
APPLICANT: Bast Jr., Robert C.
APPLICANT: Bast Jr., Robert C.
APPLICANT: Bustali, Laijos
APPLICANT: Hortobagyi, Gabriel N.
APPLICANT: Bast Jr.
Berich Funda
APPLICANT: Sahin, Aysegul
APPLICANT: Sahin, Aysegul
APPLICANT: Mails, Gardon B.
TITLE OF INVENTION: COMPOSITIONS, KITS, AND METHODS FOR IDENTIFICATION, ASSESSMENT,
TITLE OF INVENTION: COMPOSITIONS, AND THERAPY OF BREAST CANCER
TITLE OF INVENTION: PREVENTION, AND THERAPY OF BREAST CANCER
TILLE REFERENCE: MILOS B.
TITLE OF INVENTION: PREVENTION, AND THERAPY OF BREAST CANCER
TILLE OF INVENTION: PREVENTION, AND THERAPY OF BREAST CANCER
TILLE OF INVENTION NUMBER: US 60/299, 887
PRIOR FILING DATE: 2001-06-21
PRIOR FILING DATE: 2001-06-27
PRIOR APPLICATION NUMBER: US 60/306,501
PRIOR APPLICATION NUMBER: US 60/305,002
PRIOR APPLICATION NUMBER: US 60/325,002
PRIOR PILING DATE: 2001-09-36
PRIOR FILING DATE: 2000-05-14
NUMBER OF SEQ ID NOS: 506
SPETURE FILING DATE: 2000-05-14
NUMBER OF SEQ ID NOS: 506
SEC ID NO 6: 500
                                                                                                                                                                                                                                                                                                                                                                      49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                   517
                                                                                                                                                                                                                                                                                                                                                                                                       109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             578 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 637
                                                                                                                                                                                                                                                                    48
                                                                                                                                                                                                                                                                                                1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                               12;
                                                                                                                                                       Query Match 97.0%; Score 1149; DB 14; Length 1464; Best Local Similarity 93.6%; Pred. No. 1.8e-58; Matches 206; Conservative 0; Mismatches 2; Indels 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  169 GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         638 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 65, Application US/10177293
Publication No. US20030124128A1
GENERAL INFORMATION:
APPLICANT: Lillie, James
APPLICANT: Glatt, Karen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Zhao, Xumei
Gannavarpu, Manjula
Kamatkar, Shubhangi
Mertens, Maureen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Myer, Vic
Wang, Youzhen
Xu, Yongyao
Hoersch, Sebastian
Monahan, John
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Meyers, Rachel E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE: PRT
ORGANISM: Homo sapiens
                              LENGTH: 1464
TYPE: PRT
CRGANISM: Homo sapiens
US-10-149-352-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US-10-177-293-65
     SEQ ID NO 2
                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ਨੇ
                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
```

This Page Blank (uspto)

```
September 24, 2004, 11:06:55; Search time 5.27357 Seconds (without alignments) 2063.622 Million cell updates/sec
GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                      OM protein - protein search, using sw model
                                                                                                                                                                 Run on:
```

US-10-658-989A-1 1184 1 GPPGEFGPTGLFGPPGERGG......GEQGVPGDLGAPGFSGPAGG 209 141681 segs, 52070155 residues BLOSUM62 Gapop 10.0 , Gapext 0.5 Title: Perfect score: Sequence: Scoring table:

141681 Total number of hits satisfying chosen parameters:

Searched:

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries Minimum DB seq length: 0 Maximum DB seq length: 200000000

SwissProt\_42:\* Database : Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

•	-	Description	cani		ratt		gallu	59 bos		mus 1		gallı	homo	homo	rattı	mus	pog	Q01149 mus musculu			2 cani		oncorhy	P02467 gallus gall	rifti	рошоц	рошо	ETW.	_	cani	33 bos t	gallı		рошо	P13941 rattus norv
SUMMARIES		QI.	CA11_CANFA	CA11 HUMAN	CA11 RAT	CA11_MOUSE	CA11_CHICK	CA12_BOVIN	CA12 HUMAN	CA12_MOUSE	CA11_BOVIN	CA13_CHICK	CA25 HUMAN	CA13_HUMAN	CA21 RAT	CA13 MOUSE	CA13 BOVIN	CA21_MOUSE	CA21_BOVIN	CA21 HUMAN	CA21_CANFA	CA21_RANCA	CA21_ONCMY	CA21 CHICK	CAFF RIFPA	CA15_HUMAN	CA2B_HUMAN		CA1B HUMAN					묲	CA13_RAT
		ength DB	1460 1	1464 1	671 1	1453 1	1453 1	747 1	1418 1	1459 1	779 1	1262 1	1496 1	1466 1	1372 1	1464 1	1049 1	1372 1	1364 1	1366 1	1366 1	1355 1	1356 1	1362 1			1736 1						75		m
	Ouerv		97.0	97.0	4,	94.3	90.1	77.1	72.8	70.9	9.69	67.1	66.4		64.5	٠.	64.3			62.4	ä	59.4	80	4.	ω.	Η.	σ					48.6	48.5	48.4	48.4
		Score	1149	1149	1118	1116	1067	913	862	839	824	794.5	786	176	764	763	761.5	760	744	739	732	703	693.5	650.5	629.5	909	590.5	584.5	577	576	576	575.5	574.5	573.5	572.5
	Pegult	No.	1	7	m	4	ഹ	ø	7	80	σ	10	11	12	13	14	15	16	17		6	20	21	22	23	24	25	26	27	28	29	30	31	32	33

Q14050 homo sapien P25940 homo sapien	Q61245 mus musculu Q02388 homo sapien	P29400 homo sapien Q07092 homo sapien	PO8125 gallus gall	Q03592 nomo sapien Q28668 oryctolagus	
CA39 HUMAN	CA1B_MOUSE CA17_HUMAN	CA1F_HUMAN	CA19_HUMAN CA1A_CHICK	CA1A HUMAN CA21_RABIT	CA19 MOUSE CA24_HUMAN
4 u	, 4. 4. i – i –	35	4 1	0 46 0 45	 
68	1804	168 160	9 9 2	5.0	92 171
48.3	48.0	47.6	46.9	46.7	46.3
571.5	568.5	563 561	555.5	552.5	548.5
ы. 4. п	3 8 8 3 6 8	38	40 41	4 4 3 8	4 4 4 5

## ALIGNMENTS

SITE

g ઠે 임

à

g

à

ò

SOTTERFERENCE

```
SEQUENCE OF 425-1464 FROM N.A.
MEDLINE=84080385; PubMed=6689127;
Bernard M.P., Chu M.-L., Myers J.C., Ramirez F., Eikenberry E.F.,
Prockop D.J.;
"Nucleotide sequences of complementary deoxyribonucleic acids for the
pro alpha 1 chain of human type I procollagen. Statistical evaluation
of structures that are conserved during evolution.";
Hiochemistry 22:5213-5223 (1983).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             REVIEW ON VARIANTS.
MEDLINE=91184577; PubMed=2010058;
Kuivaniemi H., Tromp G., Prockop D.J.;
"Mutations in collagen genes: causes of rare and some common diseases in humans.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kuivaniemi H., Tromp G., Prockop D.J.,
"Mutations in fibrillar collagens (types I, II, III, and XI), fibril-
associated collagen (type IX), and network-forming collagen (type X)
cause a spectrum of diseases of bone, cartilage, and blood vessels.";
Hum. Mutat. 9:300-315(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 1-34 FROM N.A.

MEDLINE=88097389; PubMed=3480516;

Bornstein P., McKay J., Morishima J.K., Devarayalu S., Gelinas R.E.;

"Regulatory elements in the first intron contribute to
transcriptional control of the human alpha 1(1) collagen gene.";

Proc. Natl. Acad. Sci. U.S.A. 84:8869-8873(1987).
                                               Morgan P.H., Jacobs H.G., Segrest J.P., Cunningham L.W.; "A comparative study of glycopeptides derived from selected vertebrate collagens. A possible role of the carbohydrate in fibril
                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-88124208; PubMed-3340531;
Maekelae J.K., Raassina M., Virta A., Vuorio E.;
"Human pro alpha 1(I) collagen: cDNA sequence for the C-propeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Rossouw C.M.S., Vergeer W.P., du Plooy S.J., Bernard M.P., Ramirez de Wet W.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 1-34 FROM N.A.
MEDLINE=85130970; PubMed=2857713;
Chu M.-L., de Wet W.J., Bernard M.P., Ramirez F.;
Chi W. Structural analysis of the human pro-alpha 1 (I) collagen gromoter structure, Alul repeats, and polymorphic transcripts.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Byers P.H., Wallis G.A., Willing M.C.; "Osteogenesis imperfecta: translation of mutation to phenotype.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "DNA sequences in the first intron of the human pro-alpha 1(I) collagen gene enhance transcription.", J. Biol. Chem. 262:15151-15157(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Dalgleish R.;
"The human type I collagen mutation database.";
Nucleic Acids Res. 25:181-187(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nucleic Acids Res. 16:349-349(1988)
                                                                                                                    formation.";
J. Biol. Chem. 245:5042-5048(1970)
                              MEDLINE=71001508; PubMed=4319110;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 1-44 FROM N.A.
MEDLINE=88033098; PubMed=2822714;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=97255959; PubMed=9101290;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REVIEW ON OI VARIANTS.
MEDLINE=91374476; PubMed=1895312;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REVIEW ON OI VARIANTS.
MEDLINE=97169389; PubMed=9016532;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Med. Genet. 28:433-442(1991).
                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 1229-1454 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FASEB J. 5:2052-2060(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 REVIEW ON VARIANTS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  domain.
  Η.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    168
                                                                                                                                                                                                                                                                                                                                                                                                                                                       513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          574 GYMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 633
                                                                                                                                                                                                                                                                                                                                                                                                            48
                                                                                                                                                                                                                                                                                                                                                                                                                                             454 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                  GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Click E.M., Bornstein P.; "Isolation and characterization of the cyanogen bromide peptides from the alpha 1 and alpha 2 chains of human skin collagen."; Biochemistry 9:4699-4706(1970).
                                                                                                                                                                                                                                                                                                                                                         12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 1-181 FROM N.A.

MEDLINE=84270697; PubMed=6462220;

Chu M.-L., de Wet W.J., Bernard M.P., Ding J.-F., Morabito M.,

Myers J., Williams C., Ramirez P.;

"Human pro alpha n(I) collagen gene structure reveals evolutionary

conservation of a pattern of introns and exons.";

Nature 310:337-340(1984).
                                                                                     NOWHELICAL REGION (N-TERMINAL).
TRIPLE-HELICAL REGION.
NONHELICAL REGION (C-TERMINAL).
CELL ATTACHMENT SITE (POTENTIAL).
CELL ATTACHMENT SITE (POTENTIAL).
N-LINKED (GLCCNAC...) (FOTENTIAL).
G-> A (in Ol; severe).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryoča, Metazoa, Chordata, Craniata, Vertebrata, Buteleostomi,
Mammalia; Butheria, Primates, Catarrhini, Hominidae, Homo.
NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SECUENCE OF 1-472 FROM N.A.
MEDLIFES 8902564; PubMed=1178743;
Tromp G., Kuivanieni H., Stacey A., Shikata H., Baldwin C.T.,
Jaenisch R., Prockup D.J.;
"Structure of a full-length cDNA clone for the prepro alpha 1(1)
chain of human type I procollagen.";
Biochem. J. 253:919-922(1988)
                                                                                                                                                                                                                                                                                                       Score 1149; DB 1; Length 1460;
Pred. No. 4.1e-48;
0; Mismatches 2; Indels 12
                    COLLAGEN ALPHA 1(I) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE.
VWFC.
                                                                                                                                                                                                                                     138762 MW; 58E3674D2B570697 CRC64;
AMINO-TERMINAL PROPEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        POZ-12. (1993), Q15176; 21-JUL-1986 (Rel. 01, Created) 01-MAR-1989 (Rel. 10, Last sequence update) 10-OCT-2003 (Rel. 42, Last annotation update) collagen alpha 1(I) chain precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT; 1464 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TISSUE=Skin;
MEDLINE=71038625; PubMed=5529814;
                                                                                                                                                                                                                                                                                                                                                       .
0
                                                                                                                                                                                                                                                                                                         97.08;
                                                                                                                                                                                                                                                                                                                              93.6%;
                                                                                                                                                                                                                                                                                                                           Best Local Similarity 93.6
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
157
1214
1460
92
174
1188
1214
743
1091
                                                                                                                                                                                                                                                            AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 162-301.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   [4]
SEQUENCE OF 263-268.
                                                               34
158
1189
1789
1741
1089
1361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                    -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       169
                                                                                                                                                                                                         CARBOHYD
                                                                                                                                                                                                                                                         SEQUENCE
                                                                                                                                                                                                                                                                                                    Query Match
                                                            DOMAIN
DOMAIN
DOMAIN
                                                                                                                                                                                                                                VARIANT
                    CHAIN
PROPEP
                                                                                                                                     DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 2

(D11_HUMAN

(D11_HUMAN

DT 21_JUL

DT 01_NAR=

DT 10_OCT-

DT 01_NAR=

DT 01_NAR=

OC CLIAN

(C BUKARY

(C BUKA
                                                                                                                                                         SITE
```

<u>.</u>

```
"A lethal variant of osteogenesis imperfecta has a single base mutation that substitutes cysteine for glycine 904 of the alpha 1(I) chain of type I procollagen. The asymptomatic mother has an unidentified mutation producing an overmodified and unstable type I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       638 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
97.0%; Score 1149; DB 1;
Best Local Similarity 93.6%; Pred. No. 4.1e-48;
Matches 206; Conservative 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CA11 RAT STANDARD; PRT; 671 AA. P02454; P02455; 21-JUL-1986 (Rel. 01, Created) PFB-1994 (Rel. 28, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ıt skin and
the amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Collagen alpha 1(I) chain (Fragments)
COL1A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of rat
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Lype I collagen determine .... J. Clin. Invest. 84:1206-1214(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Comparative sequence studies of ra
The absence of a short sequence at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=69155173; PubMed=5777344;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE OF 20-55.
MEDLINE=67165368; PubMed=4290711;
                                                                                                                                          procollagen.";
J. Clin. Invest. 83:574-584(1989);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                rat skin collagen.";
Biochemistry 6:788-795(1967)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Biochemistry-8:63-71(1969)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (Rat)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT OI-II CYS-422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        norvegicus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5-19.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=10116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           alpha-1 chain.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bornstein P.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         [3]
SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rattus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 3
CA11_RAT
ID 1 CA11
RAT
DT 021-0
DT 021-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    a
                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDIINE 89308591; PubMed = 2745420;
Marini J.C., Grange D.K., Gottesman G.S., Lewis M.B., Koeplin D.A.;
"Osteogenesis imperfecta type IV. Detection of a point mutation in one alpha 1(1) collagen allele (COLIA1) by RNA/RNA hybrid analysis.";
J. Biol. Chem. 264:11893-11900(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDIANT OI SER-1022.
MEDIANT OI SER-1022.
MEDIANE=90062068; PubMed=2511192;
Pack M., Constantinou C.D., Kalia K., Nielsen K.B., Prockop D.J.;
Substitution of serine for alpha 1(I)-glycine 844 in a severe
variant of osteogenesis imperfecta minimally destabilizes the triple
helix of type I procollagen. The effects of glycine substitutions on
thermal stability are either position of amino acid specific.";
J. Biol. Chem. 264:19694-19699(1989).
                                                                                                                                                                                                                                                                                                                 MEDLINE-87222295; PubMed-3108247;
Bateman J.F., Chan D., Walkers I.D., Rogers J.G., Cole W.G.; "
"Lethal perinatal osteogenesis imperfecta due to the substitution of arginine for glycine at residue 391 of the alpha 1(1) chain of type I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT OI-II ARG-842.
MEDIATE-8829828; PubNed=3403550;
MEDIATE-8829828; PubNed=3403550;
Bateman J.F., Lamande S.R., Dahl H.H., Chan D., Cole W.G.;

"Substitution of arginine for glycine 664 in the collagen alpha 1(I)
chain in lethal perinatal osteogenesis imperfecta. Demonstration of
the peptide defect by in vitro expression of the mutant cDNA.";
J. Biol. Chem. 263:11627-11630(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT OI-II VAL-434.
MEDLINE-89255493; PubNed=2470760;
Patterson E., Sony E., Bonadio J.;
"RNA sequence analysis of a perinatal lethal osteogenesis imperfecta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT OI-II CYS-926.
When the second of the sliph I chain to cysteine and destabilizes the triple helix a lethal variant of osteogenesis imperfecta.";
Bool chem. 262:14737-14744(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT OI CYS-1195.

WEDLINE-89218628; PubMed=3244312;

Labhard M.E., Wirtz M.K., Pope F.M., Nicholls A.C., Hollister D.W.

"A cysteine for glycine substitution at position 1017 in an alpha
1(I) chain of type I collagen in a patient with mild dominantly
inherited osteogenesis imperfecta.";

Mol. Biol. Med. 5:197-207(1988).
                                                                                                                                                 nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANTS OI-II ALA-1106; VAL-1151; ARG-1154 AND VAL-1184.
MEDLINE=89380165; PubMed=2777764;
Lamande S.R., Dahl H.-H.M., Cole W.G., Bateman J.F.;
"Characterization of point mutations in the collagen COLIA1 and
COLIA2 genes causing lethal perinatal osteogenesis imperfecta.";
J. Biol. Chem. 264:15809-15812(1989).
                                                  VARIANT OI-II CYS-1166.
MEDLINE-86287390; PubMed-3016737;
Cohn D.H., Byers P.H., Steinmann B., Gelinas R.E.;
"Lethal osteogenesis imperfecta resulting from a Bingle change in one human pro alpha 1(1) collagen allele.";
Proc. Natl. Acad. Sci. U.S.A. 83:6045-6047(1986).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT OI-II CYS-1082.
MEDLINE=89109573; PubMed=2913053;
Constantinou C.D., Nielsen K.B., Prockop D.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Biol. Chem. 264:10083-10087(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            collagen.";
J. Biol. Chem. 262:7021-7027(1987)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT OI-IV SER-1010.
                                                                                                                                                                                                                                                                                           VARIANT OI-II ARG-569
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    [16]
```

```
577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  168
                                                                                                                                                                                                                                                                                                                                                                                                                                       517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                637
                                                                                                                                                                                                                                                                                                                                                                                         48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109 GVMGFPGFKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGBRGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          õŧ
                                                                                                                         ρţ
                                                                                                                                                                                                                                                                                                                                                                                         GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=67162268; PubMed=5337886; Kang A.H., Bornstein P., Piez K.A.; Mang A.H., Bornstein P., Piez K.A.; The amino acid sequence of peptides from the cross-linking region
                                                                                                                         for glycine 1(I) chains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and tendon collagen. II.
VARIANTS OI CYS-272; CYS-704 AND CYS-896.

VARIANTS OI CYS-272; CYS-704 AND CYS-896.

MEDLINE=90009313; PubMed=2794057;
Starman Berger D., Charbonneau H., Harrylock M., Weis M.A., Weiss L., Graham J.M., Byers P.H.;

Weiss L., Graham J.M., Byers P.H.;

"Osteogenesis imperfecta. The position of substitution for glyc:

Cysteine in the triple helical domain of the pro alpha 1(I) cha type I collagen determines the clinical phenotype.";
                                                                                                                                                                                                                                                                                                                                            12;
                                                                                                                                                                                                                                                                                              Length 1464;
                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         prolyl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bornstein P.; "The incomplete hydroxylation of individual
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          collagen."
```

ä

Butler W.T.;

```
EMBL, M11432; AAA40832.1; ALT SEQ.
INTERPRO; IPRO08161; Clg hellX.
InterPro; IPR008160; Collagen.
Profrom: naccontrol of the collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               671 AA; 60615 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               90.08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity
Matches 198; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MOD RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CALL MOUSE
ID CALL MOUSE
DT 01-JUL
DT 01-JUL
DT 28-FEB
DE COLLAI
OC BUKARY,
OC BUKARY,
OC MAMMAL
OC BUKARY,
OC MAMMAL
OC BUKARY
OC MAMMAL
OC BUKARY
OC MAMMAL
OC BUKARY
OC BUKAR
        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             日
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the oxygen atom of a post-translationally added hydroxyl group.

This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=72136131; PubMed=4335087;
Ballan G., Click E.M., Bornstein P.;
"Structure of rat skin collagen alpha 1-CB8. Amino acid sequence of the hydroxylamine-produced fragment HA1.";
Biochemistry 10:4470-4478(1971).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ō
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE OF 239-418,
MEDLINE-73006942; PubMed-4342027;
Balian G., Click E.M., Hermodson M.A., Bornstein P.;
"Structure of rat skin collagen alpha 1-CBB. Amino acid sequence the hydroxyl amine-produced fragment HA2.";
Biochemistry 11:3798-3806(1972);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PTM: Proline residues at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the
                                            SEQUENCE OF 56-102.
MEDLINE-71262178; PubMed-4327399;
BULLER W.T., Ponds S.L.;
"Chemical studies on the cyanogen bromide peptides of rat skin collagen. Amino acid sequence of alpha 1-CB4.";
                                                                                                                                                                                                                                                                                                                                 "Chemical studies on the cyanogen bromide peptides of rat skin collagen. The covalent structure of alpha 1-CB5, the major hexose-containing cyanogen bromide peptide of alpha 1."; Biochemistry 9:44-50(1970).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE-74271984; PubMed-4366532; Butler W.T., Underwood S.P., Finch J.E. Jr.; Charles on the cyanogen bromide peptides of rat skin collagen. Amino acid sequence of alpha 1-CB3."; Biochemistry 13:2946-2953(1974).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=74011954; PubMed=4126850;
Stoltz M., Timpl R., Furthmayr H., Kuehn K.;
Structural and imminogenic properties of a major antigenic
determinant in neutral salt-extracted rat-skin collagen.";
Eur. J. Biochem. 37:287-294(1973).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQÜENCE OF 651-671.
MEDLINE=73049455; PubMed=4636751;
Stooltz M., Timpl R., Kuehn K.;
"Non-helical regions in rat collagen alpha 1-chain.";
FEBS Lett. 26:61-65(1972).
Chem. 242:2572-2574(1967)
                                                                                                                                                                                                                                                                              MEDLINE=70085124; PubMed=5411206;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF 140-238.
                                                                                                                                                                                                                                                   SEQUENCE OF 103-139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 419-567
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 568-651
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     hydroxyapatite.
```

```
use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       416 GVMGFPGPKGTAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGAPGPAGPAGERGEQGPA 475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Therefore, productory (right) through the product of the predict o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     356 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGZBGRPGPAGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=96033240; PubMed=8535610;
Li S.W., Khillan J., Prockop D.J.;
"The complete cDNA coding sequence for the mouse pro alpha 1(1) chain
of type I procollagen.";
Matrix Biol. 14:593-595(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Rodentia, Sciurognathi, Muridae, Murinae, Mus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SKIN COLLAGEN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 1; Length 671;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MAJOR ANTIGENIC DETERMINANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9DC3114204AC4918 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HYDROXYLATION (PROBABLE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPGFQGLPGPAGPPGEAGKPGZZGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SALT-EXTRACTED RAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94.4%; Score 1118; DB 1
90.0%; Pred. No. 7e-47;
ive 5; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CA11 MOUSE STANDARD; PRT, 1453 AA. P11087; 060635; 01-JUL-1989 (Rel. 11, Created) 01-NOV-1997 (Rel. 35, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update) Collagen alpha 1(1) chain precursor. Mus musculus (Mouse).
```

ä

Gaps

12;

506

48

168

end

566

```
567 GVMGFPGPKGTAGEPGKAGERGLPGPPGAVGPAGKDGEAGAQGAPGPAGPAGERGEQGPA 626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   109 GVMGFPGPKGAAGEPGKAGERGVPGPPCAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 GPP-------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        447 GPPGPAGEEGKRGARGEPGPSGLPGPPGERGGPGSRGFPGADGVAGPKGPSGERGAPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryoča, Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=82231995; PubMed=7093229;
Highberger J.H., Corbett C., Dixit S.N., Yu W., Seyer J.M.,
Kang A.H., Gross J.;
"Amino acid sequence of chick skin collagen alpha 1(1)-CB8 and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          [2]
SEQUENCE OF 1-144 FROM N.A.
MEDLINE=88007542; PubMed=2820966;
Finer M.H., Aho S., Gerstenfeld L.C., Boedtker H., Doty P.;
Finer M.H., Aho S., Gerstenfeld Mithin the promoter region and the "Unusual DNA sequences located within the promoter region and the first intron of the chicken pro-alpha 1(1) collagen gene.";
J. Biol. Chem. 262:13323-13332(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDINE-88056316; PubMed-3678834;
Finer M.H., Boedtker H., Doty P.;
"Construction and characterization of cDNA clones encoding the 5'
     VWFC 2; 1.
rix; Connective tissue; Repeat; Hydroxylation;
                                                                                                                                                                                            VWFC.
NONHELICAL REGION (N-TERMINAL).
TRIPLE-HELICAL REGION.
NONHELICAL REGION (C-TERMINAL).
N-LINKED (GLCNAC. . .) (POTENTIAL)
N-LINKED (GLCNAC. . .) (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 1116; DB 1; Length 1453;
Pred. No. 1.5e-46;
4; Mismatches 5; Indels 12;
                                                                                                                                                                                                                                                                                                                                                           736 CELL ATTACHMENT SITE (POTENTIAL)
1084 CELL ATTACHMENT SITE (POTENTIAL)
1450 A -> V (IN REF. 5).
AA; 137944 Mw; 38802ES35DF81808 CRC64;
                                                                                                             AMINO-TERMINAL PROPEPTIDE.
COLLAGEN ALPHA 1(I) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    169 GSPGFOGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGARG 666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the chicken pro alpha 1(I) collagen mRNA., the 56:71-78(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21-JUL-1986 (Rel. 01, Created)
01-OCT-1989 (Rel. 12, Last sequence update)
10-OCT-2003 (Rel. 42, Last annocation update)
Collagen alpha 1(1) chain precursor.
PROSITE; PS50184; VWFC 2; 1.
Extracellular matrix; Connective Glycoprotein; Collagen; Signal.
SIGNAL
PROPEP 23 151 AMI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity 90.5%;
Matches 199; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 1-153 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COLLAI.
Gallus gallus (Chicken)
                                                                                              22
151
1207
1453
87
                                                                                                                                                                                                                                                       1181
1207
1354
1354
1084
1450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=9031;
                                                                                                                                                                                                                                                       168
1182
1354
1354
1082
1450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CA11 CHICK
P02457;
                                                                                                                                                                                                                                                                                     DOMAIN
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                  SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
                                                                                                                                             CHAIN
PROPEP
DOMAIN
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CA11_CHICK
AC PO245_CK
AC PO245_CK
DT 21-JUL
DT 10-OCT-I
DT 10-OCT-I
DT 00-OCT-I
DT 00-OCT-I
DT 00-OCT-I
DT 01-OCT-I
DT 01-OCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gallus
                                                                                                                                                                                                                                                                                                                                                                          SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT
           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its mes by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PTM: Prolines at the third position of the tripeptide repeating unit (G-\bar{x}-Y) are hydroxylated in some or all of the chains. SIMILARITY: Contains 1 VMFC domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF 1442-1453 FROM N.A.
MDDILINES BR124776; PubMed=3340560;
MOOSI-Ehner K., Harbers K., Harbers K.,
"Two mrNas of mouse pro alpha 1(1) collagen gene differ in the size
of the 3'-untranslated region.";
Nucleic Acids Res. 16:773-773(1988).
-I- PUNCTION: Type I collagen is a member of group I collagen
                                                                                                                                                                                                                                                                                     Monson J.M., Friedman J., McCarthy B.J.;
"DNA sequence analysis of a mouse pro alpha 1 (I) procollagen gene:
evidence for a mouse B1 element within the gene.";
Mol. Cell. Biol. 2:1362-1371(1982).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (fibrillar forming collagen).
--- SUBUNIT: Trimers of one alpha 1(I) chains.
--- TISSUE SPECIFICITY: Forms the fibrils of tendon, ligaments and bones. In bones the fibrils are mineralized with calcium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Monson J.M., McCarthy B.J.;
"Identification of a Balb/c mouse pro alpha 1(1) procollagen gene evidence for insertions or deletions in gene coding sequences.";
DNA 1:59-69(1981).
                                            SEGUENCE OF 518-1128 FROM N.A.
MEDLINE-86137403, PubMed=3841523,
French B. T., Lee W.-H., Maul G.G.;
French T., Lee W.-H., Maul G.G.;
Finchectide sequence of a cDNA clone for mouse pro alpha 1(I)
                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE OF 735-878 AND 1005-1058 FROM N.A MEDLINE=83157109; Pubmed=6219867;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        InterPro: IPR008161; Clg helix.
InterPro: IPR008160; Colladen.
InterPro: IPR001865; Fib_collagen_C.
InterPro: IPR0018181; Fibrinogen_C.
InterPro: IPR001007; VWF_C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Probon; PD000007; Clg_helix; 1.
Probon; PD002079; Fib_collagen_C; 1.
SMART; SM00038; COLFI; 1.
SMART; SM00214; VWC; 1.
                                                                                                                                                                                                                                     SEQUENCE OF 735-1130 FROM N.A. MEDLINE=83141374; PubMed=6298597;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         K03032; AAA37332.1; JOINED.
K03034; AAA37332.1; JOINED.
K03034; AAA37332.1; JOINED.
K03035; AAA37332.1; JOINED.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAA37332.1; JOINED AAA37332.1; JOINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pfam; PF01410; COLFI; 1.
Pfam; PF01391; Collagen; 18.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; U08020; AAA88912.1; -. EMBL; X15896; CAA33904.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAA37333.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROSITE, PS01208; VWFC_1, 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAA37334.1; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAA37332.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAA37332.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MGI:88467; Collal
                                                                                                                                                         collagen protein.";
Gene 39:311-312(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           hydroxyapatite.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  M14423;
M17491;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         K03030;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             X06753;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    K03036;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL;
EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL;
EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PIR;
MGD;
```

φ

```
DOMAIN
MOD_RES
MOD_RES
MOD_RES
MOD_RES
MOD_RES
MOD_RES
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                         Query Match
                                                                                                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 6
CA12 BOVIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COLZA1
       SOLUTION
                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                             임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ઠે
                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                   엄
                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                        [4]
SEQUENCE OF 1200-1205.
MEDLINE-72243016; PubMed=5047697;
Eyre D.R., Glimcher M.J.;
Eyre D.R., Glimcher M.J.;
Eyre p.R., Gommun. 48:720-726(1972).
                                                                                                                                                                              Fuller F., Boedtker H.; "Sequence determination and analysis of the 3' region of chicken proalpha 1(1) and pro-alpha 2(1) collagen messenger ribonucleic acids including the carboxy-terminal propeptide sequences."; Biochemistry 20:996-1006(1981).
complete primary structure of the helical portion of the chick skin collagen alpha 1(I) chain.";
Biochemistry 21:2048-2055(1982).
                                                                                                                                                                                                                                                           SEQUENCE OF 1311-1453 FROM N.A.

MEDLINE=80134546; PubMed=6987088;
Showalter A.M., Pesciotta D.M., Eikenberry E.F., Yamamoto T.,
Pastan I., Decrombrugghe B., Fietzek P.F., Olsen B.R.;
"Nucleotide sequence of a collagen cDNA-fragment coding for the
"Nucleotide sequence of a collagen cDNA-fragment coding for the
"Nucleotide sequence of a collagen son.";
FEBS Lett. 111:61-65(1980).
-I- FUNCTION: Type I collagen is a member of group I collagen
(fibrillar forming collagen).
-I- SUBUNI: Trimers of one alpha 2(I) and two alpha 1(I) chains.
-I- TISSUE SPECIFICITY: Forms the fibrils of tendon, ligaments and
bones. In bones the fibrils are mineralized with calcium
                                                                                                                                                                                                                                                                                                                                                                                                                                            PTM: Proline residues at the third position of the tripeptide repeating unit. (G-X-Y) are hydroxylated in some or all of the chains. Pro-1153 is the only 3-hydroxypro and the only hydroxylated proline in position. SIMILARITY: Contains 1 VWPC domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Probom, PD000007; Clg helix; 2.
Probom; PD002078; Fib_collagen_C; 1.
Probom; SM00018; CoLFF; 1.
PROSITE; SM00014; VWC, 1.
PROSITE; PS50184; VWFC 1; 1.
PROSITE; PS50184; VWFC 2; 1.
Extracellular matrix; Connective tissue; Repeat; Hydroxylation; Glycoprotein; Cllagen; Signal; Pyrrolidone carboxylic acid. SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AMINO-TERMINAL PROPEPTIDE.
COLLAGEN ALPHA 1(I) CHAIN.
C-TERMINAL PROPEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Interpro: TPR008161; Clg helix.
Interpro: TPR008160; Collagen.
Interpro: IPR008160; Collagen.
Interpro: IPR002181; Fib_collagen_C.
Interpro: IPR001007; WF_C.
Pfam; PF01410; CCLF1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; M17839; AAA48704.1; --
EMBL; M17838; AAA48704.1; --
EMBL; W00401; CAA23695.1; --
EMBL; W10571; AAA48671.1; ALT_SEQ.
EMBL; M17677; AAA48672.1; --
EMBL; A27179; A27179
PIR; IS0629; IS0629.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               22
151
1205
1453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam; PF00093; vwc;
                                                                                                                                                                                                                                                                                                                                                                                                                                  hydroxyapatite.
```

```
ï
                                                                                                                                                                                                                                                                                                                                                                                                                                                  108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   567 GVMGFPGPKGAAGEPGKPGERGAPGPPGAVGAAGKDGEAGAQGPPGPTGPAGERGEQGPA 626
                                                                                                                                                                                                                                                                                                                                                    1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                                                                                                                                                                                                                                                                                                                                                  49 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKIGPPGPAGODGRPGPPGPRGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        507 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDCKTGPPGPAGQDGRPGPAGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Miller E.J., Lunde L.G.;
"Isolation and characterization of the cyanogen bromide peptides from the alpha 1(11) chain of bovine and human cartilage collagen.";
Biochemistry 12:3153-3159(1973).
                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TISSUE=Cartilage;
MEDLINE=76253504; PubMed=782511;
MEDLINE=707., Miller E.J., Finch J.E. Jr.;
Butler W.T., Miller E.J., Finch J.E. Jr.;
"The covalent structure of cartilage collagen. Amino acid sequence of the NH2-terminal helical portion of the alpha 1 (II) chain.";
Biochemistry 15:3000-3006(1976).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Butler W.T., Finch J.E. Jr., Miller E.J.,
"The covalent structure of cartilage collagen. Evidence for sequence
heterogeneity of bovine alpha!(II) chains.";
J. Biol. Chem. 252:639-643(1977).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bos taurus (Bovine).
Sukaryota, Metazoa; Chordata, Craniata, Vertebrata, Buteleostomi,
Mammalia; Butheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos
                                                                                                                                                                                                                                                                                                          12;
                                                                                                                                                                                                                                                          DB 1; Length 1453;
                   PYRROLIDONE CARBOXYLIC ACID.
HYDROXYLATION (POTENTIAL).
HYDROXYLATION (POTENTIAL).
HYDROXYLATION (POTENTIAL).
HYDROXYLATION (POTENTIAL).
HYDROXYLATION.
                                                                                                                                                                                                                                                                                                          14; Indels
                                                                                                                                                            7 F -> L (IN REF. 5).
1 Q -> H (IN REF. 6).
137789 MW; 3BC6152134271F4D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAPGFQGLPGPAGPPGEAGKPGEQGVPGNAGAPGPAGARG 666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CA12 BOVIN STANDARD, PRT; 747 AA. P02459; Q28070; Q9XT24; 21-JUL-1966 (Rel. 0, Created) 30-MX-2000 (Rel. 39, Last sequence update) 15-MAR-2004 (Rel. 43, Last annotation update) collagen alpha 1(11) chain precursor (Fragments).
                                                                                                                                                                                                                                                        Score 1067; DB 1
Pred. No. 3e-44;
                                                                                                                                                                                                                                                                                                       4; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 1-15.
TISSUB=Cartilage;
MEDLINE=73258693; PubMed=4732855;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 139-198.
TISSUE=Cartilage;
MEDLINE=77093864; PubMed=833147;
                                                                                                                                                                                                                                                     90.1%;
                                                                                                                                                                                                                                                                                                     Matches 190; Conservative
89
152
254
851
1081
1097
1153
1187
                                                                                                                                                                                                                Ą.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE OF 16-177.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 139-417.
TISSUE=Cartilage;
                                                                                                                                                                                                                                                                              Similarity
31
152
254
1081
1097
11153
11441
1453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=9913;
```

```
121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GEAGL PCAKGLIGS PGS PGPDGKTGP PGPAGODGR PGPPGARGOAGVMGF PGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GEPGKAGERGLPGAPGLRGLPGKDGETGAAGPPGPAGPAGBRGEQGAPGPSGFCGLPGPP 486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A. MEDAMEd=2587267; MEDAMED W., Horton W.; SU M.W., Lee B., Ramirez F., Machado M., Horton W.; "Nucleotide sequence of the full length cDNA encoding for human type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bukaryota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi;
Mammalia; Butheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    [2]
SEQUENCE OF 1-28 FROM N.A.
MEDLINE=87031574; PubMed=3021582;
Nunez A.M., Kohno K., Martin G.R., Yamada Y.;
"Promoter region of the human pro-alpha 1(II)-collagen gene.";
Gene 44:11-16(1986).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21-JUL-1986 (Rel. 01, Created)
01-JAN-1990 (Rel. 13, Last sequence update)
15-MAR-2004 (Rel. 43, Last annotation update)
Collagen alpha 1(II) chain precursor [Contains: Chondrocalcin]
COL2A1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 747;
                                                                                                                                                                                                                                              L -> A (IN MINOR COMPONENT).
Q -> L (IN MINOR COMPONENT).
G -> Z (IN REF. 3).
AP -> PA (IN REF. 3).
EA -> AS (IN REF. 3).
T -> Q (IN REF. 4).
S -> A (IN REF. 4).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        39; Indels
                                                                                                                                                                                                                                                                                                                                                           T -> Q (IN REF. 4).
S -> A (IN REF. 4).
P -> A (IN REF. 4).
Q -> T (IN REF. 4).
Q -> T (IN REF. 4).
G -> G (IN REF. 4).
G -> P (IN REF. 5).
G -> P (IN REF. 5).
                                                                                 ·
·
                                           ·
                                                                                                      HYDROXYLATION.
O-LINKED (GAL. . .).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          77.1%; Score 913; DB 1; 78.4%; Pred. No. 3.6e-37; iive 6; Mismatches 39;
                                                             HYDROXYLATION.
O-LINKED (GAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT; 1418 AA
                                                                                                                                                                      HYDROXYLATION.
O-LINKED (GAL)
                                                                                                                                                                                                              HYDROXYLATION.
O-LINKED (GAL)
                                                                                                                                                   HYDROXYLATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGEGGKPGDQGVPGEAGAPGLVGPRG 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             II procollagen.";
Nucleic Acids Res. 17:9473-9473(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      71329 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local Similarity 78.4%;
nes 163; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      747 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CA12 HUMAN
P02458;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              427
                                                                                                                                                 MOD_RES
MOD_RES
CARBOHYD
MOD_RES
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                         CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    487
                                                                                                          MOD RES
                                                                                                                                                                                                                                                                                                                                                                CONFLICT
                                                                                                                                                                                                                                                                                                   CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                              CONFLICT
                                                                 RES
                                                                                                                                                                                                                                                            VARIANT
                                                                                                                                                                                                                                                                              VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CA12_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ठ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Analysis of CDNA and genomic clones coding for the pro alpha 1 chain of calf type II collagen.";

Nuclear Acids Res. 13:2815-2826(1985).

Nuclear Acids Res. 13:2815-2826(1985).

-!- FUNCTION: Collagen type II is specific for cartilaginous tissues.

-!- FUNCTION: Collagen type II is specific for cartilaginous tissues.

-!- FUNCTION: Collagen type II is specific for cartilaginous tissues.

-!- FUNCTION: Collagen type II is specific for cartilaginous tissues.

-!- FTM: Proline residues at the third position of the tripeptide repeating unit (G.X-Y) are hydroxylated in some or all of the chains. Hydroxylation on Pro-9 is involved in cross-linking.

-!- FTM: O-linked glycans consist of Glc-Gal disaccharides bound to the oxygen atom of post-translationally added hydroxyl groups.
                                                                                                                                                                   MEDIINE=14163168; PubMed=4857180;
Butler W.T., Miller B.J., Finch J.B. Jr., Inagami T.;
"Homologous regions of collagen alpha1(I) and alpha1(II) chains:
apparent clustering of variable and invariant amino acid residues.";
Biochem. Biophys. Res. Commun. 57:190-195(1974).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TISSUE=Cartilage;
MEDLINE=99410731; PubMed=10479530;
MEDLINE=99410731; PubMed=10479530;
Tang B., Chiang T.M., Brand D.D., Gumanovskaya M.L., Stuart J.M.,
Kang A.H., Myers L.K.;
"Molecular definition and characterization of recombinant bovine CB8 and CB10: immunogenicity and arthritogenicity.";
Clin. Immunol. 92:256-264(1999).
                                                                                                                                                                                                                                                                                                                              TISSUB=Cartilage;
MEDLINE=94194070; PubMed=7511638;
Brand D.D., Myers L.K., Terato K., Whittington K.B., Stuart J.M.
Rosloniec E.F.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Prodom, PD000007; Cig helix; 2.
Prodom, PD002078; Fib_collagen_C; 1.
SMART; SM00038; COLFI; 1.
PROSITE, PS01208; WWC 1; PARTIAL.
Extracellular matrix; Connective tissue; Repeat; Hydroxylation;
                                                                                                                                                                                                                                                                                                                                                                                       KOSLODIEC E.F.;
"Characterization of the T cell determinants in the induction of autoimmune arthritis by bovine alpha 1(II)-CB11 in H-2q mice.";
J. Immunol. 152:3088-3097(1994).
MEDLINE-89231683; PubMed-2714276;
Seyer J.M., Hasty K.A., Kang A.H.;
"Covalent structure of collagen. Amino acid sequence of an
arthritogenic cyanogen bromide peptide from type II collagen of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE-85215651; PubMed-2582365;
Sangiorgi F.O., Benson-Chanda V., de Wet W.J., Sobel M.E.,
Ramirez F.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CARBOXYL-TERMINAL PROPEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COLLAGEN ALPHA 1 (II) CHAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro; IPR008161; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR008165; Fib_collagen_C.
InterPro; IPR001007; VWF_C.
                                                                                                             Eur. J. Biochem. 181:159-173(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AF138957; AAD42347.1; -.
                                                                                                                                                                                                                                                                                                         SEQUENCE OF 180-272 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; X02420; CAA26269.1; -.
PIR; A90369; CGBO6C.
PIR; 145876; 145876.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE OF 417-566 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF $67-747 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EMBL; L28918; AAA30436.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lycoprotein; Collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             >566
                                                                                                                                                        SEQUENCE OF 418-492
                                                                                             bovine cartilage.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            566
```

NON CONS

366

```
1(II)
   SEQUENCE OF 1227-1289 FROM N.A.
MEDIATE-86104139; PubMed=3002437;
Munez A.M., Francomano C., Young M.F., Martin G.R., Yamada Y.;
"Isolation and partial characterization of genomic clones coding for a human pro-alpha I (II) collagen chain and demonstration of restriction fragment length polymorphism at the 3' end of the gene.";
Biochemistry 24:6343-6348(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REVIEW ON VARIANTS.
MEDLINE=91184577; PubMed=2010058;
Kuivaniemi H., Tromp G., Prockop D.J.;
"Mutations in collagen genes: causes of rare and some common diseases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDINE=97255959; PubMed=9101290;
MEDINE=97255959; PubMed=9101290;
Kuivaniemi H., Tromp G., Prockop D.J.;
"Mutations in fibrillar collagens (types I, II, III, and XI), fibril-
associated collagen (type IX), and network-forming collagen (type X)
cause a spectrum of diseases of bone, cartilage, and blood vessels.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Glycine to serine substitution in the triple helical domain of proalpha 1 [II] collagen results in a lethal perinatal form of short-limbed dwarfism ";
J. Biol. Chem. 264:18265-18267 (1989).
                                                                                  Cheah K.S.E., Stoker N.G., Griffin J.R., Grosveld F.G., Solomon E., "Identification and characterization of the human type II collagen
                                                                                                                                                                                                                                             SEQUENCE OF 1106-1418 FROM N.A.
MEDLINE-88067771; Pubmed-2825137;
Elima K., Vuorio T., Vuorio B.;
"Determination of the single polyadenylation site of the human pro alpha 1 (II) collagen gene.";
Nucleic Acids Res. 15:9499-9504(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 1176-1226 FROM N.A.
MEDLINE=84118798; PubMed=6320112;
Strom C.M., Upholt W.B.;
"Isolation and characterization of genomic clones corresponding to the human type II procollagen gene.";
Nucleic Acids Res. 12:1025-1038(1984).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SECUENCE OF 35-167 FROM N.A.
MEDLINE-82313138 PubMed=2714801;
Su M.W., Benson-Chanda V., Vissing H., Ramirez F.;
"Organization of the exons coding for pro alpha 1(II) collagen N-
propeptide confirms a distinct evolutionary history of this domain the fibrillar collagen genes.";
Genomics 4:438-441(1989).
                                                                                                                                                                                             "Construction and identification of a cDNA clone for human type II procollagen mRNA.";
Biochem. J. 229:183-188(1985).
                                                                                                                                                                           ن
.
                                                                                                                                           SEQUENCE OF 1120-1398 FROM N.A.
MEDLINE=85306861; PubMed=3840017;
Elima K., Maekelae J.K., Vuorio T., Kauppinen S., Knowles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARÍANT SER-1074.
MEDLINE=99036909; PubMed=2572591;
Vissing H., D'Alessio M., Lee B., Ramirez F., Godfrey M.,
Hollister D.W.;
                         Ramirez F.;
Submitted (DEC-1988) to the EMBL/GenBank/DDBJ databases.
                                                                                                                        Proc. Natl. Acad. Sci. U.S.A. 82:2555-2559(1985)
                                                 [4]
SEQUENCE OF 963-1418 FROM N.A.
MEDLINE-85190534; PubMed=3857598;
 [3]
SEQUENCE OF 432-1145 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FASEB J. 5:2052-2060(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hum. Mutat. 9:300-315(1997)
                                                                                                                                                                                     Vuorio E.;
                                                                                                              gene
```

```
1213
1459
1459
1186
1213
29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1459 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           29
                                                                                                                                                                                                                                                                                                                                                                                                 Name=Long;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VARSPLIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VARSPLIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
    SOLUTION TO THE TEREST TO THE TRANSPORT OF THE TRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ਨੇ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           543 GEPGKAGEKGLPGAPGLKGLPGKJGETGAEGPPGPAGPAGEKGEQGAPGPSGFQGLPGPP 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         423 GARGEPGGVGPIGPPGERGAPGNRGFPGQDGLAGPKGAPGERGPSGLAGPKGANGDPGRP 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP 60
                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=93140139; PubMed=8423604; Cole W.G., Hall R.K., Rogers J.G.; "The clinical features of spondyloepiphyseal dysplasia congenita resulting from the substitution of glycine 997 by serine in the alpha J. Hall chain of type II collagen."; J. Med. Genet. 30:27-35(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                               ĭ
                                                                                                                                                                                                                                                                                                                                                                                                 a
gene
                                                                                                                                                                                                                              VARIANT SEDC CYS-206.

Williams C.J., Considine E.L., Knowlton R.G., Reginato A., Neumann Harrison D., Euxton P., Jimenez S.A., Prockop D.J.;
Spondyloepiphyseal dysplasia and precocious osteoarthritis in a family with an Arg75-->Cys mutation in the procollagen type II gene (COL2A1).",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Rodentia, Sciurognathi, Muridae, Murinae, Mus.
                                                                               type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-93315508; PubMed-8325895;
Chan D., Taylor T.K.F., Cole W.G.;
"Characterization of an arginine 789 to cysteine substitution in
alpha 1 (II) collagen chains of a patient with spondyloepiphyseal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Metsaranta M., Toman D., de Crombrugghe B., Vuorio E.;
"Mouse type II collagen gene. Complete nucleotide sequence, exon
"tructure, and alternative splicing";
J. Biol. Chem. 266.1882-16889(1991).
Vikkula M., Ritvaniemi P., Vuorio A.F., Kaitila I., Ala-Kokko L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-DEC-1992 (Rel. 24, Created)
01-DEC-1992 (Rel. 24, Last sequence update)
15-MAR-2004 (Rel. 43, Last annotation update)
Collagen alpha 1(II) chain precursor [Contains: Chondrocalcin]
                                              Peltonen L.;
"A mutation in the amino-terminal end of the triple helix of collagen causing severe osteochondrodysplasia.";
Genomics 16:282-285(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              72.8%; Score 862; DB 1; Length 1418; 74.0%; Pred. No. 1.4e-34; ive 11; Mismatches 43; Indels C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A., AND ALTERNATIVE SPLICING. MEDLINE=91358489; PubMed=1885613;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT; 1459 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPPGEGGKPGDQGVPGEAGAPGLVGPRG 630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   dysplasia.";
J. Biol. Chem, 268:15238-15245(1993)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Genet. 92:499-505(1993)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      154; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT SEDC SER-1128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VARIANT SEDC CYS-920.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mus musculus (Mouse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CA12 MOU
P28481;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CA12 MOUSE

110 CA12 M
A CA12 M
A CA12 M
DI 1-DEC.
DT 10-DEC.
DT 10-DEC.
DT 01-DEC.
DT 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Hum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
    RAHRET REPRET RE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ద
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its most by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                            collagen mRNAs.";

Elochim. Biophys. Acta 1089:241-243(1991).

-I. FUNCTION: Collagen type II is specific for cartilaginous tissues.

-I. SUBDNIT: Homotrimers of alpha 1(II) chains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   R ProDom; PD002079; Fib_collagen_C; 1.

R SMART; SM00214; VWC; 1.

R PROSITE; PS01208; VWFC_1; 1.

R PROSITE; PS01208; VWFC_2; 1.

R Extracellular matrix; Connective tissue; Repeat; Hydroxylation; Glidaen; Signal; Alternative splicing.

R ISIGNAL 26 153 (BY SINLARINAL PROPEPTIDE (BY SINLARINAL).

F ROPEP 26 153 (COLLAGEN ALENA).

CHAIN 154 1213 COLLAGEN ALENA (II) CHAIN.

PROPEP 1214 1459 CHONDROCALCIN.

CHAIN 32 99 VWFC.
                                                                                                                                                                                                                                                                                                                                                                                                  repeating
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .
                                                                                   ĭ
                                                                                                                                                                                                                                                                                                                                                              IsoId=P28481-2; Sequence=VSP 001139, VSP_001140;
--- PTH: Prolines at the third position of the tripeptide repeaunt (G-X-Y) are hydroxylated in some or all of the chains --- SIMILARITY: Contains 1 VMPC domain.
SEQUENCE OF 1455-1459 FROM N.A.
MEDLINE=21274355, PubMed=2054364;
MEDLINE=21274355, PubMed=2054364;
MEDLINE=21274355, PubMed=2054364;
MESpecific Aybridization probes for mouse type I, II, III and
"Specific hybridization probes for mouse type I, II, III and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1459;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NONHELICAL REGION (C-TERMINAL).
Q -> R (in isoform Short).
/FTId=VSP_001139.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 46; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Missing (in isoform Short). /FIId=VSP_001140.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MW; F6C84FA7C532E7F2 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TRIPLE-HELICAL REGION.
                                                                                                                                                                                                                                                        Event=Alternative splicing; Named isoforms=2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; Score 839; DB 1;
; Pred. No. 1.7e-33;
12; Mismatches 46
                                                                                                                                                                                                                                                                                                  IsoId=P28481-1; Sequence=Displayed;
Name=Short;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MGD, MGI: 88452, CO12a1.
InterPro; IPR008161; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR000885; Fib collagen_C.
InterPro; IPR001007; VWF_C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ů.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; M65161; AAA68100.1; -. EMBL; X57982; CAA41047.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ProDom; PD000007; Clg helix;
ProDom; PD002078; Fib_collage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfam, PF01410; COLFI; 1. Pfam, PF01391; Collagen; 18. Pfam, PF00093; vwc; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     139154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10.98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity 72.1
Matches 150; Conservative
```

```
hydroxyapatite. The third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains. Pro-726 is the only 3-hydroxypro and the only hydroxylated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rauterberg J., Timpl R., Furthmayr H.; "Structural characterization of N-terminal antigenic determinants in calf and human collagen.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=73049499; PubMed=4673951;
Fietzek P.P., Wendt P., Kell I., Kuehn K.;
"The covalent structure of collagen: amino acid sequence of alpha-1-
CB3 from calf skin collagen.";
FEBS Lett. 26:74-76(1972).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 563-675. PubMed=4343808; MEDLINE-73042276; PubMed=4343808; Wendt P., Mark K.V.D., Rexrodt F., Kuehn K.; Wendt P., Mark K.V.D., Rexrodt F., Ruehn K.; Mark covalent structure of colladen. The amino-acid sequence of the 112-residues. Amino-terminal part of peptide alpha-1-CB6 from calf-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 676-751.
MEDLINE=13042275; PubMed=4343807;
Fietzek P.P., Rexrodt F.W., Wendt P., Stark M., Kuehn K.;
"The covalent structure of collagen. Amino-acid sequence of peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 20-145.
MEDLINE-76022320; PubMed=1164916;
MEDLINE-76022320; PubMed=1164916;
Fiberzek P.P., Kuehn K.;
Fine covalent structure of collagen: amino-acid sequence of the cyanogen-bromide peptides alpha-1-CB2, alpha-1-CB4 and alpha-1-CB5 from calf-skin collagen.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Merazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -1- FUNCTION: Type I collagen is a member of group I collagen (fibrillar forming collagen).
-1- SUBUNIT: Trimers of one alpha 2(I) and two alpha 1(I) chains.
-1- TISSUE SPECIFICITY: Forms the fibrils of tendon, ligaments and bones. In bones the fibrils are mineralized with calcium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF 295-562.
MEDLINE=74086118; PubMed=4359390;
Fierzek P.P., Rexrodt F.W., Hopper K.E., Kuehn K.;
"The covalent structure of collagen. 2. The amino-acid sequence alpha-1-CB7 from calf-skin collagen.";
Eur. J. Biochem. 38:396-400(1973).
                                                                                                                                                                                                                                                      21-JUL-1986 (Rel. 01, Created)
01-FEB-1994 (Rel. 28, Last sequence update)
15-MAR-2004 (Rel. 43, Last annotation update)
Collagen alpha 1(1) chain (Fragments).
                                                                                                                                                                                                                           779 AA
                                                             671
                                  644 GPPGEGGKQGDQGIPGEAGAPGLVGPRG
GPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      3ur. J. Biochem. 30:163-168(1972).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE OF 1-19.
MEDLINE=72255334; PubMed=4115172;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            skin collagen.";
Eur. J. Biochem. 30:169-183(1972)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eur. J. Biochem. 27:231-237(1972)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          J. Biochem. 52:77-82(1975).
                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 146-294.
                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bos taurus (Bovine)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=9913;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 alpha-1-CB6-C2."
                                                                                                                                                                                                                       BOVIN
181
                                                                                                                                                   RESULT 9

CA11_BOVIN

CA11_BOVIN

DT 21_UUL-
DT 21_UUL-
DT 01_EB-
DT 01_FEB-
DT 01_FEB-
DT 01_FEB-
DT 01_FEB-
DT 01_FEB-
DE COLIAGE
CO
                                                                                                                                                                                                                    CA11_BC
P02453;
à
                                               셤
```

```
89 GARGIPGTAGIPGMKGHRGFSGIDGAKGDAGPAGPKGEPGSPGENGAPGQMGPRGLPGFP 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQ 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        29 GPPGAPGPQGFQGPPGEPGASGPMGPRGPPGPPGKNGDDGEAGKPGRPGERGPPGPQ 88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPGEPGPTGLPGPPGERGGPGS-----RGFPGADGVAGPKGPAGERGSPGPAGPKGSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            149 GPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQ
                                                                           -!- MISCELMANDLOUS.

INTERPRO, IRRO08161; C1g helix.
INTERPRO; IRR008161; Collagen.
INTERPRO; IRR008160; Collagen.
INTERPRO; IRR001007; VWF C.
PRODOM; PD000007; C1g helix; 1.
PROSTITS; PS01208; VWFC 1; PARTIAL.
EXTRACEllular matrix; Connective tissue; Repeat; Hydroxylation; Glycoprotein; Collagen; Pyrrolidone carboxylic acid.
MOD RES 9 PYRROLIDONE CARBOXYLIC ACID.
MOD RES 9 INVOLVED IN CONVERTED TO AN ALDEHYDE GROUP THAT IS INVOLVED IN CROSS-LINKING.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               55 GEAGRPGEAGLPGAKGLIGSPGPDGKIGPPGPAGQDGRPGPPGPPGARGQAGVMGFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi;
Archosauria, Aves, Neognathae, Galliformes, Phasianidae; Phasianinae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6, Gaps
                 -!- FTM: O-linked glycan consists of a Glc-Gal disaccharide bound to
the oxygen atom of a post-translationally added hydroxyl group.
-!- MISCELLANEOUS: The complete chain contains 1052 residues.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TISSUE=Kidney;
MabLine=2426642; PubMed=8206952;
Nah H.-D., Niu Z., Adams S.L.;
"An alternative transcript of the chick type III collagen gene that does not encode type III collagen.";
J. Biol. Chem. 269:16443-16448 (1994).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1; Length 779;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pred. No. 5.8e-33;
4; Mismatches 50; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                O-LINKED (GAL. . .).
HYDROXYLATION (POTENTIAL)
HYDROXYLATION (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HYDROXYLATION (POTENTIAL) HYDROXYLATION (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       E554A7FF084283D1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CA13 CHICK STANDARD, PRT; 1262 AA. P12105; P79758; P79759; Q90794; Q92029; Q1-0CT-1989 (Rel. 12, Created) 16-0CT-2001 (Rel. 40, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update) collagen alpha 1(III) chain precursor (Fragments).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HYDROXYLATION (HYDROXYLATION (HYDROXYLATION (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  175 GLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HYDROXYLATION
HYDROXYLATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HYDROXYLATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 824;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       70346 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              69.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local Similarity 72.0%;
Matches 154; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 1-886 FROM N.A.
proline in position X.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COL3AI.
Gallus gallus (Chicken).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   658
670
726
779 AA;
                                                                                                                                                                                                                                                                                                                                                                                                      103
1103
1115
1145
346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=9031;
                                                                                                                                                                                                                                                                                                                                                                                                      MOD RES
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOD_RES
MOD_RES
NON_CONS
MOD_RES
MOD_RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOD_RES
MOD_RES
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOD_RES
MOD_RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 10
CA13 CHICK
ID 10 CHIOS
DT 01-0CT
DT 28-FED
DE COLIA9
GN GAILUS
CO ALFONS
CO 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gallus
à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            οĘ
```

;

54

```
52 GSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQAGVM 111
                                                                                                                                                                                                                                                                                                                                                      1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPK 51
                                                                                                                                                                                                                                                                                                                                                                                  112 GFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSP
                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Genetic distance of two fibrillar collagen loci, COL3A1 and COL5A2, located on the long arm of human chromosome 2."; Genomics 3:275-277(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 1227-1496 FROM N.A.
SEQUENCE OF 1227-1496 FROM N.A.
MEDLINE=85289337, PubMed=2411731;
Myers J.C., Loidl H.R., Seyer J.M., Dion A.S.;
"Complete primary structure of the human alpha 2 type V procollagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Woodbury D., Benson-Chanda V., Ramirez F.; "Mondpury D., penson-Chanda V., Ramirez F.; "Amino-terminal propertide of human pro-alpha 2(V) collagen conforto the structural criteria of a fibrillar procollagen molecule."; J. Biol. Chem. 264:2735-2738(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Primates, Catarrhini, Hominidae, Homo.
NCBI_TaxID=9606,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE OF 1449-1496 FROM N.A.
MEDLINE=89134450; PubMed=3224983;
Tsipouras P., Schwartz R.C., Liddell A.C., Salkeld C.S., Weil D.,
Ramirez F.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 398-1496 FROM N.A.
MEDLINE=87146331; PubMed=3029669;
Weil D., Bernard M.P., Gargano S., Ramirez F.;
"The pro alpha 2 (V) collagen gene is evolutionarily related to major fibrillar-forming collagens.";
Nucleic Acids Res. 15:181-198(1997).
                                                                                                                                                                                                                                                                                                   6
                                                                                                            .) (POTENTIAL)
                                                                                                                                                                                                                                            Length 1262;
INTERCHAIN (BY SIMILARITY).

HYDROXYLATION (BY SIMILARITY).

HYDROXYLATION (BY SIMILARITY).

N-LINKED (GLCNAC. .) (POTENTIAL

E -> K (IN REF. 2).

F -> S (IN REF. 3).

WH; 96ABE7B2E9DEB43D CRC64;
                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                172 GFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      638 GLÓGLÞGGPGPAGENGKPGEPGPKGDIGGPGFPGPKG 674
                                                                                                                                                                                                                                            67.1%; Score 794.5; DB 1;
65.9%; Pred. No. 2e-31;
ive 13; Mismatches 52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-APR-1988 (Rel. 07, Created)
01-JAN-1990 (Rel. 13, Last sequence update)
10-CTT-2003 (Rel. 42, Last annotation update)
collagen alpha 2(V) chain precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT; 1496 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COOH terminal propeptide.";
J. Biol. Chem. 260:11216-11222(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 1-463 FROM N.A. MEDLINE=89123368; PubMed=2914927;
     995 INTER
262 HYDRG
283 HYDRG
859 HYDRG
1163 N-LII
96 E->
1132 F->
A; 121249 MW;
                                                                                                                                                                                                                                                                               Best Local Similarity 55.7 Matches 143; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
        995 995 26 26 26 283 885 859 1163 116 1132 1132 1132 1132 1132 1133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HUMAN
        DISULFID
MOD_RES
MOD_RES
MOD_RES
CARBOHYD
                                                                                                                                        CONFLICT
                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CA25 HU
P05997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COLSAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CA25_HUMAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  POT TO THE SERVICE SER
           STATES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             СP
                                                                                                                                                                                                                                                                                                                                                               ਨੇ
                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bloinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                         Nucleic Acids Res. 11:2733-2744(1983).

Nucleic Acids Res. 11:2733-2744(1983).

-!- FUNCTION: Collagen type III occurs in most soft connective tissues along with type I collagen.

-!- SUBBUIT Trimers of identical alpha 1(III) chains. The chains are linked to each other by interchain disulfide bonds. Trimers are also cross-linked via hydroxylysines.

-!- FUNT Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY).
TRIPLE-HELICAL REGION (BY SIMILARITY).
NONHELICAL REGION (C-TERMINAL) (BY
        SEQUENCE OF 29-96; 332-397; 431-484; 503-535 AND 869-976 FROM N.A. BEDLINES-84270665; PubMede-5547770; Yanada Y., Liau G., Madryj M., Obici S., de Crombrugghe B.; "Conservation of the sizes for one but not another class of exons
                                                                                                                                                                                                  SEQUENCE OF 977-1262 FROM N.A.
MEDLINE=83220816; PubMed=6856474;
Yamada Y., Kuhn K., de Crombrughe B.;
"A conserved nuclecide sequence, coding for a segment of the C-
propeptide, is found at the same location in different collagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NONHELICAL REGION (N-TERMINAL) (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PROSITE; PS01208; VWFC 1; 1.
PROSITE; PSS0184; VWFC 2; 1.
Extracellular matrix; Connective tissue; Repeat; Hydroxylation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AMINO-TERMINAL PROPEPTIDE (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COLLAGEN ALPHA 1(III) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERCHAIN (BY SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Interpro; IPR008161; Clg helix.
Interpro; IPR008160; Collagen.
Interpro; IPR0018085; Fib_collagen.C.
Interpro; IPR002181; Fib_inogen.C.
Interpro; IPR001007; VWF.C.
ProDom; PD000007; Clg helix; 1.
ProDom; PD0000078; Fib_collagen.C; 1.
SYART; SW00218; Fib_collagen.C; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            X00822; CABS2686.1) -..
X00823; CABS2686.1, ALI JOINED.
X00826; CAA25397.1; ALI SEQ.
X00825; CAA25398.1; -..
X00828; CAA25399.1; -..
X00830; CAA25401.1; -..
X00831; CAA25401.1; -..
X00831; CAA25401.1; -..
X00831; CAA25401.1; -..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            K02301; AAD15298.1; -.
M36662; AAA18519.1; ALT_SEQ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VENTO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Collagen; Signal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; U07973; AAA83407.1; -.
                                                                                                               two chick collagen genes.";
Nature 310:333-337(1984).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   88
164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIR; A05269; A05269
PIR; I50694; I50694
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3lycoprotein;
SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NON CONS
NON CONS
DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROPER
```

SEQUENCE OF 208-227.

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the FNBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "A single base mutation in COL5A2 causes Ehlers-Danlos syndrome type II.",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         [8]
WARIANT EDS-II ARG-960.
WEDLINE=98455031; PubMed=9783710;
Richards A.J., Martin S., Nicholls A.C., Harrison J.B., Pope F.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Michalickova K., Susic M., Willing M.C., Wenstrup R.J., Cole W.G., "Mutations of the alpha2 (V) chain of type V collagen impair matrix assembly and produce Ehlers-Danlos syndrome type I."; Hum. Mol. Genet. 7:249-255(1998).
                                                                                                                                                                                                                          TISSUE=Bone;
MEDLINE=94237164; PubMed=8181482;
Moradi-Ameli M., Rousseau J.C., Kleman J.P., Champliaud M.F.,
Boutillon M.M., Bernillon J., Wallach J.M., van der Rest M.;
"Diversity in the processing events at the N-terminus of type-V
                                                                                               Isolation of the alpha 3-chain of human type V collagen and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Min., Jours, (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (2001) (20
                                                                                                                             characterization by partial sequencing."
Biol. Chem. Hoppe-Seyler 373:69-75(1992)
                                                                                                                                                                                                                                                                                                                                                                                     Eur. J. Biochem. 221:987-995(1994)
                        TISSUE=Placenta;
MEDLINE=92239022; PubMed=1571108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=98087576; PubMed=9425231;
                                                                                                                                                                                                    SEQUENCE OF 288-297 AND 606-617.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL, J04478; AAA51859.1; --
EMBL, X04798; CAA28454.1; --
EMBL, M11718; AAA5208.1; --
PIR, A31427; CGHUZV.
PDB, 1A9A; 18-NOV-98.
Genew, HGNC:2210; CCL5A2.
                                                                                                                                                                                                                                                                                                                                                            collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                      DISEASE,
```

```
61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGPPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       501 GPRGDPGTLGPPGPVGERGAPGNRGFPGSDGLPGPKGAQGERGPVGSSGPKGSQGDPGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        0; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TISSUE-Skin fibroblast,
MEDLINE=89350838; PubMed=2764886;
Ala-Kokko L., Kontusaari S., Baldwin C.T., Kuivaniemi H.,
Prookop D.J.;
"Structure of cDNA clones coding for the entire prepro alpha 1 (III)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
                                                            Friem; Friuvy3; VWC; 1.
Probom; PD000007; Clg_helix; 5.
Probom; PD000007; Clg_helix; 5.
Probom; PD000078; Fib_collagen_C; 1.
SMART; SM0014; VWC; 1.
PROSITE; PS01208; VWFC; 1; 1.
PROSITE; PS50184; VWFC 1; 1.
PROSITE; PS50184; VWFC 2; 1.
PROSITE; PS50184; VWFC 3; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1496;
                                                                                                                                                                                                                            COLLAGEN ALPHA 2 (V) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE.
VWPC.
                                                                                                                                                                                                                                                                                                                                                                                                               1438 1438 F -> S (IN REF. 3).
1460 1460 E -> O (IN REF. 4).
1496 146 V -> A (IN REF. 4).
1496 AA; 144720 MW; 82827CI7A8644F5A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        53; Indels
                                                                                                                                                                                                                                                                                                                                                                           A -> P (IN REF. 6).
K -> T (IN REF. 3).
F -> S (IN REF. 3).
E -> Q (IN REF. 4).
V -> A (IN REF. 4).
                                                                                                                                                                                                                                                                                                                                                   G -> R (in EDS-II)
/FTId=VAR 013588.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match 66.4%; Score 786; DB 1;
Best Local Similarity 67.3%; Pred. No. 5.6e-31;
Matches 140; Conservative 15; Mismatches 53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21-JUL-1986 (Rel. 01, Created)
01-JAN-1990 (Rel. 13, Last sequence update)
10-OCT-2003 (Rel. 42, Last annotation update)
Collagen alpha 1(III) chain precursor.
                                                                                                                                                                                                                                                                                                                      HYDROXYLATION.
HYDROXYLATION.
G -> R (in EDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT; 1466 AA.
                                                                                                                                                                                                                                                                                        HYDROXYLATION
HYDROXYLATION
                                                                                                                                                                                                                                                                          HYDROXYLATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     681 GPPGEGGKPGDQGVPGGPGAVGPLGPRG 708
InterPro; IPR002181; Fibrinogen_C.
InterPro; IPR001007; VWF_C.
                         Pfam; PF01410; COLFI; 1.—
Pfam; PF01391; Collagen; 18.
Pfam; PF00093; vwc; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                  1418
1438
1460
1496
                                                                                                                                                                                                                 26
1226
1496
97
290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                1418
1438
1460
1496
                                                                                                                                                                                                                                                                                                                                                   960
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CA13 HUMAN S
P02461; Q15112;
21-JUL-1986 (Rel
                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                CONFLICT
                                                                                                                                                                                                                           CHAIN
PROPEP
DOMAIN
MOD RES
MOD RES
MOD RES
MOD RES
                                                                                                                                                                                                                                                                                                                                                                                  CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                               CONFLICT
                                                                                                                                                                                                               SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CA13 HUMAN

ID CA13 HUMAN

ID CA13 H

DT 21-UUL1

DT 21-UUL1

DT 01-UAN

ON 10-CAN

ON HOME

ON MORNMALL

RR 11

RR PEOCUEN

RA PLOCKO

RT STRUC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COL3A1
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
```

ö

```
SEQUENCE OF 1176-1466 FROM N.A.
MEDLINE=85157600; PubMed=2579949;
Chu M.-L., Weil D., de Wet W.J., Bernard M.P., Sippola M., Ramirez F.;
"Isolation of cDNA and genomic clones encoding human pro-alpha 1
"Ill collagen. Partial characterization of the 3' end region of the gene.",
                                                                                                                                                                                                SEQUENCE OF 168-398.
MEDLINE=7713474; Pubbed=557335;
Seyer J.M., Kang A.H.;
"Covalent structure of collagen: amino acid sequence of cyanogen bromide peptides from the amino-terminal segment of type III collagen biometry liver.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE OF 1065-1466 FROM N.A. MEDLINE-85087944; PubMed-6096827; Loidl H.R., Brinker J.M., May M., Pihlajaniemi T., Morrow S., Rosenbloom J., Myers J.C.; "Molecular cloning and carboxyl-propeptide analysis of human type III
chain of human type III procollagen. Differences in protein structure from type I procollagen and conservation of codon preferences."; Biochem. J. 260:509-516(1989).
                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 399-727.
MEDLINE=79000343; PubMed=687591;
Seyer J.M., Kang A.H.;
"Covalent:structure of collagen: amino acid sequence of five consecutive CNBr peptides from type III collagen of human liver.";
Biochemistry 17:3404-3411(1978).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 950-1466 FROM N.A.
MEDLINE=88189827; PubMed=3357782;
Mankoo B.S., Dalgleish R.;
Mankoo B.S., Dalgleish R.;
Muman pro alloin 1 [11] collagen: cDNA sequence for the 3' end.";
Nucleic Acids Res. 16:2337-2337(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REVISION TO 1184.
MEDLINE=89098346; PubMed=3211760;
Molynaux K., Dalgleish R.,
"Human type III collagen 'variant' is a cDNA cloning artefact.";
Nucleic Acids Res. 16:11833-11833 (1988).
                                                                       SEQUENCE OF 149-1225 FROM N.A. MEDILINE-89386015; PubMed=2780304; Janeczko R.A., Ramirez F., Munica F., Munico and amino acid sequences of the entire human alpha "Nucleotide and amino acid sequences of the entire human alpha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 728-964.
MEDLINE=80198382; PubMed=6246925;
Seyer J.M., Mainardi C., Kang A.H.;
"Covalent structure of collagen: amino acid sequence of alpha (III)-CB5 from type III collagen of human liver.";
Biochemistry 19:1583-1589(1980).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 965-1200.
MEDLINE=81208139; PubMed=7016180;
Seyer J.M., Kang A.H.;
"Covalent structure of collagen: amino acid sequence of alpha I (III)-CB9 from type III collagen of human liver.";
Biochemistry 20:2621-2627(1981).
                                                                                                                                                                                                                                                                                                                                                                Seyer J.M.;
Submitted (DEC-1977) to the PIR data bank.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          procollagen.";
Nucleic Acids Res. 12:9383-9394(1984).
                                                                                                                                               (III) collagen.";
Nucleic Acids Res. 17:6742-6742(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             J. Biol. Chem. 260:4357-4363(1985)
[12]
SEQUENCE OF 1161-1200 FROM N.A.
                                                                                                                                                                                                                                                                                                                                             REVISIONS
```

```
Migoling-seipode, Pubmes-1754467, M. Chysels R.G., M. Migoling-seipode, Pubmes-1754467, M. Chysels R.G., M. Migoling-seipode, Pubmes-175467, M. Chysels R.G., M. Chistoshev P. P. Erachty, W. Chysels R.G., M. Chistoshev P. P. Erachty, W. Chysels R.G., M. With the type I collegen geses during libroblast growth.", M. Chistosher Geses during libroblast growth. M. Chistosher Geses during des during libroblast growth. M. Chistosher Geses during libroblast growth. M. Chistosher Geses during growth. M. Chistosher Geses du
```

Pope

```
SEQUENCE OF 86-98.
TISSUESAKIA
MEDLINE-67162268; PubMed=5337886;
Kang A.H., Bornstein P., Piez K.A.;
                                                                                                                                                                                                                                           Fietzek P.P., Piez K.A.; "Iselation of the cyanogen bromide peptides from "Isolation and characterization of the cyanogen bromist 2 chain of rat skin collagen."; Biochemistry 8:2129-2133(1969).
     Guenther D., Seibold S., Marx M.;
Submitted (JAN-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=71115216; PubMed=5544653;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=74055004; PubMed=4763308;
                                                                                                                                                                                                                           MEDLINE=69206881; PubMed=5785232;
                                                                                                                                                          lochemistry 6:788-795(1967).
                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 102-144
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OF 423-452.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 453-501.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 791-836.
                                                                                                                                                                                           SEQUENCE OF 99-102.
                                                                                                                                            rat skin collagen.
                                                                                                                                                                                                                                                                                                                                                PISSUE=Skin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TISSUE-Skin;
                                                                                                                                                                                                           rissum=Skin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           rissue=skin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                [5]
SEQUENCE O
TISSUE=Ski
       ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPRGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  528 GVPGGPGMRGMPGSPGGPGSDGKPGPPGSQGESGRPGPPGPSGPRGQPGVMGFPGPKGND 587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAPGROGERGGPGGPGPQGPPGRNGETGPQGPPGPTGPGGDKGDTGPPGPGLQGLQGLQGLQGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                     MEDLINE=90037070; PubMed=2808425;
Tromp G., Kuivaniemi H., Stolle C.A., Pope F.M., Prockop D.J.;
"Single base mutation in the type III procollagen gene that converts the codon for glycine 883 to aspartate in a mild variant of Ehlers-Danlos syndrome IV.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rattus norvegicus (Rat).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
                                                                                                                                                                  "A single base mutation in the gene for type III collagen (COL3A1) converts glycine 847 to glutamic acid in a family with Ehlers-Danlos syndrome type IV. An unaffected family member is mosaic for the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              acid
in a
                                                                                                               MEDLINE=92316511; PubMed=1352273;
Richards A.J., Ward P.N., Narcisi P., Nicholls A.C., Lloyd J.C.,
                  Madhatheri S.L., Kuivaniemi
793 in type III procollagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Characterisation of a glycine to valine substitution at amino position 910 of the triple helical region of type III collagen patient with Ehlers-Danlos syndrome type IV."; J. Med. Genet. 28:458-463(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=91374480; PubMed=1895316;
Richards A.J., Lloyd J.C., Ward P.N., de Paepe A., Narcisi P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                65.5%; Score 776; DB 1; Length 1466; 66.3%; Pred. No. 1.6e-30; ive 12; Mismatches 58; Indels (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=93022543; PubMed=1357232;
Johnson P.H., Richards A.J., Pope F.M., Hopkinson D.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CA21_RAT STANDARD; PRT; 1372 AA. P02466; Q9R1E8; 21-JUL-1986 (Rel. 01, Created) 28-JUL-2001 (Rel. 40, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update) Collagen alpha 2(1) chain precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                           Biol. Chem. 264:19313-19317(1989).
                Tromp G., de Paepe A., Nuytinck L.,
"Substitution of valine for glydine
Enlers-Danlos syndrome type IV.";
Hum. Mutat. 5:179-181(1995).
MEDLINE=95268429; Pubmed=7749417;
                                                                                                                                                                                                                                        Genet. 89:414-418(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                 VARIANT EDS-IV GLU-1014.
                                                                                                                                                                                                                                                        [23]
VARIANT EDS-IV ASP-1050.
                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT EDS-IV VAL-1077
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT EDS-IV GLU-1173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
es 138; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                [1]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=10116;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pope F.M.;
                                                                                                                                                                                                                         mutation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         648
```

Best Loca Matches

임

ö

d

q ò

ò

ò

CA21\_RAT 1D CA21 A 7 00.2 DT 21-3 DT 21-6-0 DT 20-1 DT 20-1

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EWBL outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is nor removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to licenseeisb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OKDER OF CNBR PEPTIDES.

MEDLINE=70181852; PubMed=5443712;

MEDLINE=70181852; PubMed=5443712;

Wunst J., Lane J.M., Fletzek P.P., Miller E.J., Piez K.A.;

"The order of the CNBr peptides from the alpha 2 chain of collagen.";

Biochem. Biophys. Res. Commun. 38:703-708 (1970).

-! FUNCTION: Type I collagen is a member of group I collagen

(fibrillar forming collagen).

-!- SUBUNIT: Trimers of one alpha 2(I) and two alpha 1(I) chains.

-!- SUBUNIT: Trimers of one alpha 2(I) and two alpha 1(I) chains.

-!- TISSUE SPECIFICITY: Forms the fibrils of tendon, ligaments and bones. In bones the fibrils are mineralized with calcium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=75059250; PubMed=4435743;
Fietzek P.P., Kuehn K.;
"The covalent structure of collagen: amino acid sequence of the N-terminal region of alpha2-CB3 from rat skin collagen and alpha2-CB3.5 from calf skin collagen.";
Hoppe-Seyler's Z. Physiol. Chem. 355:647-650(1974).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      hydroxyapatite.
-!- PTM: Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
MEDLINE=73049496; PubMed=4636752;
Fietzek P.P., Kell I., Kuehn K.;
The covalent structure of collagen. Amino acid sequence of the N-terminal region of alpha 2-CB4 from calf and rat skin collagen.";
FEBS Lett. 26:66-68(1972).
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Highberger J.H., Kang A.H., Gross J.;
Comparative studies on the amino acid sequence of the alpha 2-CB2
peptides from chick and rat skin collagens.";
Biochemistry 10:610-616 (1971).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Fietzek P.P., Kuehn K.; The covalent structure of collagen: amino acid sequence of the N-terminal region of alpha 2-CB5 from rat skin collagen."; FESS Lett. 36:289-291(973).
```

de Crombrugghe

```
roman
POTENIAL
AMNOLTERNINAL FROC.

(BY SIMILARITY).

(COLLAGEN ALPHA 2 (1) CHAIN.
CARBOXYL-TERMINAL PROPERTIDE

(BY SIMILARITY).

(CELL ATTACHMENT SITE (POTENTIAL).
CELL ATTACHMENT SITE (POTENTIAL).
CELL ATTACHMENT SITE (POTENTIAL).
CELL ATTACHMENT SITE (POTENTIAL).
CELL ATTACHMENT SITE (POTENTIAL).

CELL ATTACHMENT SITE (POTENTIAL).

PYRROLIDONE CARBOXYLIC ACID (PROBABLE).
CONVERTED TO AN ALDEHYDE GROUP THAT IS
INVOLVED IN CROSS-LINKING.

3 N-LINKED (GLCNAC...) (POTENTIAL).

32 T -> P (IN REF. 4).

432 T -> P (IN REF. 4).

432 ST -> P (IN REF. 4).

434 E -> Z (IN REF. 5).

494 E -> Z (IN REF. 5).

495 M -> A (IN REF. 6).

497 M -> A (IN REF. 6).

498 MM; BO69371A8DBB20A72 CRC64;

Annor 764, DB 1; Length 1372;

-- Als
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           448 GEPGLMGPRGLPGSPGNVGPAGKEGPVGLPGIDGRPGPIGPAGPRGEAGNIGFPGPKGPS 507
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGEAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mus musculus (Mouse).
Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi;
Mammalia, Eutheria, Rodentia, Sciurognathi, Muridae, Murinae, Mus.
                                                                                                                                                                               Extracellular matrix; Connective tissue; Repeat, Hydroxylation; Glycoprotein; Collagen; Signal, Pyrrolidone carboxylic acid. SIGNAL 1 24 SPONENTIAL. PROPEPTIDE 25 84 AMINO-TERMINAL PROPEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CA13 MOUSE STANDARD; PRT; 1464 AA. P08121; 061429; Q9CRN7; 15. UL-10999 (Rel. 08, Created) 15. UL-1999 (Rel. 38, Last sequence update) 15. MAR-2004 (Rel. 43, Last annotation update) COLlagen alpha 1(III) chain precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTAGEVGKPGERGLPGEFGLPGPAGPRG 595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
           EMBL, AF121217; AAD41775.1; -.
InterPro; IPR008161; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR00885; Fib_collagen_C.
Pfam; PF01410; COLFI; 1.
Pf0391; Collagen; 18.
ProDom; PD000007; Clg_helix; 4.
ProDom; PD002078; Fib_collagen_C; PR0000; Clg_helix; 4.
ProDom; P0002078; Fib_collagen_C; SWART; SW00038; COLFI; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
STRAIN=C57BL/6 X DBA; TISSUE=Embryo;
MEDLINE=95011609; PubMed=7926795;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                               785
830
1013
                                                                                                                                                                                                                                                                            1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       432
494
497
790
825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          502 79
825 82
1372 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 139; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                            86
1109
                                                                                                                                                                                                                                                                                                                               783
828
1011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                      MOD_RES
                                                                                                                                                                                                                                                                                                                                                                                                                                              CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 14
CA13 WOUSE
LD 70413 W
AC POR1711
DT 15-7UL
DT 
                                                                                                                                                                                                                                                                                                PROPEP
                                                                                                                                                                                                                                                                              CHAIN
                                                                                                                                                                                                                                                                                                                                   SITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
 원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \dot{\delta}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
```

```
61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGPRGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bos taurus (Bovine)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE OF 243-422.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       [1]
SEQUENCE OF 1-242.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=9913;
                                                                                                                                                                                                                                                                                                                                                                                                                                        CA13 BOVIN
P04258;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Kuhn K.;
                                                                                                                                                                                                                                                                                                                                                                                    RESULT 15
CA13_BOVIN
                                                                                  g
                                                                                                                                                                                         셤
                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                            This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
Biochim. Blophys, Acta 1089:241-243 (1991).
-!- FUNCTION: Collagen type III occurs in most soft connective tissues along with type I collagen.
-!- SUBUNIT: Trimers of identical alpha 1(III) chains. The chains are
                                                                                                                                                                                                                                         PTM: O-linked glycan consists of a Glc-Gal disaccharide bound to the oxygen atom of a post-translationally added hydroxyl group (By
                                                                               SUBUNIT: Trimers of identical alpha 1(III) chains. The chains are linked to each other by interchain disulfide bonds. Trimers are also cross-linked via hydroxylysines.

PTM: Proline residues at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MGD; MGI88453; CO13a1.

RIDEAPRO; IPR008161; C1g helix.
RIDEAPRO; IPR008161; C1dghelix.
RIDEAPRO; IPR00885; Fib_collagen.
RIDEAPRO; IPR002181; Fib_Tinogen_C.
RIDEAPRO; IPR001007; VWF_C.
RIDEAPRO; IPR001007; VWF_C.
REAPRO; PF01391; C01lagen; 18.
RPCDOm; PD001007; C1g helix; 1.
RPCDOm; PD01278; Fib_collagen_C; 1.
RWART; SM00214; VWC; 1.
RWART; SM00214; VWC; 1.
RPROSITE; PS01208; VWFC_1; 1.
RROSITE; PS01208; VWFC_1; 1.
RROSITE; PS01208; VWFC_1; 1.
RROSITE; PS01208; VWFC_1; 1.
RROSITE; PS01208; VWFC_1; 1.
RECAPROSITE; PS01208;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           169 VWFC.
169 VWFC.
169 VWFC.
170 VWFC.
186 VONHELICAL REGION (N-TERMINAL).
186 VONHELICAL REGION (C-TERMINAL).
186 VONHELICAL REGION (C-TERMINAL).
262 HYDROXYLATION (BY SIMILARITY).
263 HYDROXYLATION (BY SIMILARITY).
264 HYDROXYLATION (BY SIMILARITY).
265 HYDROXYLATION (BY SIMILARITY).
266 HYDROXYLATION (BY SIMILARITY).
267 HYDROXYLATION (BY SIMILARITY).
268 HYDROXYLATION (BY SIMILARITY).
269 HYDROXYLATION (BY SIMILARITY).
260 HYDROXYLATION (BY SIMILARITY).
261 HYDROXYLATION (BY SIMILARITY).
262 HYDROXYLATION (BY SIMILARITY).
263 HYDROXYLATION (BY SIMILARITY).
264 HYDROXYLATION (BY SIMILARITY).
265 HYDROXYLATION (BY SIMILARITY).
266 HYDROXYLATION (BY SIMILARITY).
267 HYDROXYLATION (BY SIMILARITY).
268 HYDROXYLATION (BY SIMILARITY).
269 HYDROXYLATION (BY SIMILARITY).
269 HYDROXYLATION (BY SIMILARITY).
260 HYDROXYLATION (BY SIMILARITY).
260 HYDROXYLATION (BY SIMILARITY).
260 HYDROXYLATION (BY SIMILARITY).
261 HYDROXYLATION (BY SIMILARITY).
262 HYDROXYLATION (BY SIMILARITY).
263 HYDROXYLATION (BY SIMILARITY).
264 HYDROXYLATION (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 1464;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AMINO-TERMINAL PROPEPTIDE.
COLLAGEN ALPHA 1(III) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 763; DB 1;
Pred. No. 6.7e-30;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BY SIMILARITY
                                                                                                                                                                                                                                                                                                  similarity). SIMILARITY: Contains 1 VWFC domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; K03037; -; NOT ANNOTATED_CDS.
EMBL; AK019448; BAB3Ī724.1; -.
EMBL; K57983; CAA41048.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BC058724; AAH58724.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Glycoprotein; Collagen; Signal SIGNAL 1 23 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; X52046; CAA36279.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          64.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              M18933; AAA37338.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1203
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1105
1195
1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1195
1464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    859
976
976
1093
1105
11195
11196
1196
1196
1196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIR; A27353; A27353.
PIR; S59856; S59856.
                                                                                                                                                                                                                           chains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOMAIN
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOD_RES
DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MOD RES
MOD RES
MOD RES
MOD RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CHAIN
PROPEP
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROPEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DOMAIN
```

ô

0; Gaps

13; Mismatches 59; Indels

Local Similarity 65.4% nes 136; Conservative

Best Loca Matches

Н

8

467 GSPGEPGANGLPGAAGERGPSGFRGPAGPNGIPGEKGPPGERGGPGGPGGPGPRGVAGEPGRD 526 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP 60

```
586
                                                            587 GAPGKNGERGGPGGPGLPGPAGKNGETGPQGPPGPTGPAGDKGDSGPPGPGGPGPGPGFGFG 646
                                    121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGERGEGGPAGSPGFQGLPGPA 180
527 GIPGGPGIRGMPGSPGGPGNDGKPGPPGSQGESGRPGPPGPSGPRGQPGVMGFPGPKGND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDINE-80026027; PubMed-488907;
Dewes H., Fietzek P.P., Kuhn K.;
"The covalent structure of calf skin type III collagen. II. The amino acid sequence of the cyanogen bromide peptide alpha 1(III)CB1,8,10,2 (positions 223-402).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (5) MEDLINE-80026030; PubMed=488910; MEDLINE-80026030; PubMed=488910; Dewes H., Fietzek P.P., Kuhn K.; "The covalent structure of calf skin type III collagen. V. The amino acid equence of the cyanogen bromide peptide alpha 1(III)CB9A acid equence of the cyanogen bromide peptide alpha 1(III)CB9A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           amino
chain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 423-571.

MEDLINE-80026028; PubMed=488908;
Bentz H., Fietzek P.P., Kuhn K.;
"The covalent structure of calf skin type III collagen. III. The amino acid sequence of the cyanogen bromide peptide alpha I(III)CB4 (positions 403-551).";
                                                                                                                                                                                                                                                                                                                                                                                               Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Fietzek P.P., Allmann H., Rauterberg J., Henkel W., Wachter E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "The covalent structure of calf skin type III collagen. I. The acid sequence of the amino terminal region of the alpha 1(III) (positions 1-222)."; Hoppe-Seyler's Z. Physiol. Chem. 360:809-820(1979).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 572-808.
MEDLINE-80056029; PubMed=488909;
Lang H., Glanville R.W., Fietzek P.P., Kuhn K.;
"The covalent structure of calf skin type III collagen. IV. Th
acid sequence of the cyanogen bromide peptide alpha 1(III)CBS
(postitions 552-788).";
Hoppe-Seyler's Z. Physiol. Chem. 360:841-850(1979).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE OF 948-1049.
MEDLINE-80026031; PubMed=488911;
Allmann H., Fietzek P.P., Glanville R.W., Kuhn K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Hoppe-Seyler's Z. Physiol. Chem. 360:821-832(1979)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hoppe-Seyler's Z. Physiol. Chem. 360:833-840(1979)
                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                  PRT; 1049 AA
                                                                                                               181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                     647 GPPGENGKPGEPGPKGEVGAPGAPGGKG 674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=80026026; PubMed=488906;
                                                                                                                                                                                                                                                                                    20-MAR-1987 (Rel. 04, Created)
20-MAR-1987 (Rel. 04, Last seq
16-CCT-2001 (Rel. 40, Last ann
Collagen alpha 1(III) chain.
```

```
61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 372 GLPGGPGLRGIPGSPGGPGSNGKPGPPGSQGETGRPGPPGSPGSPGQPRGQPFPGFRGND 431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     432 GAPGKNGERGGPGGPGPPGPPGFNGETGPQGPPGPTGPSGDKGDTGPPGPGCLQCLPGTS 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP 60
Gaps
                                                                                                                                                                                                                  InterPro; IPR008161; Clg_helix.
InterPro; IPR008160; Collagen.
InterPro; IPR001007; VWP C.
Pfam; PF01391; Collagen; 17.
Prodon; PD000007; Clg_hellx; 3.
PR051TE; PS01208; VWFC_1; PARTIAL.
Extracellular matrix; Connective tissue; Repeat; Hydroxylation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      492 GPPGENGKPGEPGPKGEAGAPGIPGGKGDSGAPGERGPPGAGGPPGPRGG 541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ouery Match

64.3%; Score 761.5; DB 1; Length 1049;

Best Local Similarity 60.4%; Pred. No. 6.3e-30;

Matches 139; Conservative 15; Mismatches 55; Indels 21;
                                                                                                                                                                                                                                                                                                                                                              NONHELICAL REGION (N-TERMINAL).
TRIPLE-HELICAL REGION.
NONHELICAL REGION (C-TERMINAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                   HYDROXYLATION.
HYDROXYLATION.
HYDROXYLATION.
O-LINKED (GAL. .).
O-LINKED (GAL. .).
INTERCHAIN.
INTERCHAIN.
MW, BEECJ3DIC66EC9A3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                   HYDROXYLATION
HYDROXYLATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1049 AA; 93651 MW;
                                                                                                                                                                                                                                                                                                                                                 3lycoprotein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
```

Search completed: September 24, 2004, 11:07:23 Job time : 7.27357 secs

This Page Blank (uspto)

```
5.1.6
Compugen Ltd.
GenCore version (c) 1993 - 2004
          Copyright
```

- protein search, using sw model OM protein 6; Search time 8.04914 Seconds (without alignments) 2497.663 Million cell updates/sec September 24, 2004, 11:06:56 Run on:

US-10-658-989A-1 1184 1 GPPGEPGPTGLPGPPGERGG......GEQGVPGDLGAPGPSGPAGG 209 Perfect score: Sequence:

Scoring table:

283366 segs, 96191526 residues BLOSUM62 Gapop 10.0 , Gapext 0.5 Searched:

283366 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

summaries Post-processing: Minimum Match 0% Maximum Match 100 Listing first 45

PIR 78:\*
1: pirl:\*
2: pir2:\*
3: pir3:\*
4: pir4:\* Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

Д	collagen	collagen		CGCH1S collagen	CGHU6C collagen	57 collagen	B40333 collagen	A40333 collagen	A41182 collagen	B41182 collagen	CGB01S collagen	collagen	IS0694 collagen	collagen	CGHU7L collagen	I49607 procolla	S59856 collagen	CGBO7S collagen	A43291 collagen	CGHU2S collagen		CGHU1V collagen	I50696 collagen	S23809 collagen	S18803 collagen	S42731 collagen	
Length D	1464	671	1453	1042	1487	1418	1486	1492	1419	1487	779	673	886	1496	1466	1497	1464	1049	1373	1366	1027	1838	310	1414	1843	632	964
		94.4	94.3	0	72.8	N	н	н	70.9	70.9	9.69	68,8	67.1	66.4	65.5	64.6	64.4	64.3	64.2	62.8	53.2	51.3	50.9	50.7	0	σ	49.7
Score	;	1118	1116	1067	862	860	850	847	839	839	824	815	794.5	786	776	765	763	761.5	760	744	629.5	607	602.5	6009	T.		589
Result No.		7	٣	4	Ŋ	9	7	ω	σ	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

collagen alpha 5(I	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	collagen alpha 1(X	collagen alpha 1(X	type VII collagen	collagen alpha 1(I
A55267	S18251	A40020	S28791	820819	CGHU1B	841067	CGHUZE	A05269	A54849	\$22917	A27353	523297	823810	I48103	213580
2 A55267	2 \$18251	2 A40020	2 \$28791	2 \$20819	1 CGHU1B	2 \$41067	1 CGHU2E	2 A05269	2 A54849	1 \$22917	2 A27353	2 S23297	2 \$23810	2 I48103	
754 2 A55267	01	0	7	7	٦	7	H	7	7	г	N	~	73	~	c
754 2	1024 2	3124 2	888 2	675 2	1690 1	636 2	1546 1	615 2	2944 2	1691	488 2	674 2	73	1549 2	621
754 2	48.6 1024 2	48.6 3124 2	48.6 888 2	48.4 675 2	48.4 1690 1	48.4 636 2	48.4 1546 1	48.3 615 2	47.6 2944 2	47.6 1691 1	47.5 488 2	47.4 674 2	47.4 1603 2	47.1 1549 2	2 120 0 24

## ALIGNMENTS

					31-Dec-	5233; S(		rez, F.	
					change:	5237; A3		V.; Rami	
					96 #text	943; ISE		e Wet, W	
		man	) chain		C;Date: 12-Aug-1981 #sequence_revision 04-Oct-1996 #text_change 31-Dec-	254; A39		R,D'Alessio, M.; Bernard, M.; Pretorius, P.J.; de Wet, W.; Ramirez, F.;	
		collagen alpha 1(I) chain precursor - human	N;Alternate names: procollagen alpha 1(I) chain		vision 0	335; ISS	7247	etorius,	
		n precur	llagen a	(man)	nence_re	143; A93	2852; I3	M.; Pr	
		(I) chair	s: proco	C; Species: Homo sapiens (man)	381 #segn	114, S01	5269; A29439; I53466; A02852; I37247	Bernard	9001
		alpha 1	te names	: Homo	2-Aug-19	on: 1601	439; IS	io, M.;	105.115
RESULT 1	CGH01S	ollagen	,Alterna	Species;	; Date: 1	, Accessi	269; A29	D'Aless	72 000
œ	ΰ	Ü	z	υ	υ	U	Ŋ	않	C

09400; B90567; S113 ; Pretorious, P.J. Gene 67, 105-115, 1988 Yitle: Complete nucleotide sequence of the region encompassing the first twenty-five ex A.Reference number: I60114; MUID:88329734, PMID:2843432 A.Accession: I60114

A; Accessing totals
A; Accessing totals
A; Accessing totals
A; Molecule type: DNA
A; Molecule type: DNA
A; Mesidues: 1-569, L', 271-589 < CAL>
A; Residues: 1-569, L', 271-589 < CAL>
A; Cross-references: 1-569; NID: 1978593; PIDN: AABS9373.1; PID: 1979594
A; Cross-references: 198: MZ0789; NID: 1978593; PIDN: AABS9373.1; PID: 1979594
B; Tromp, G.; Kuivaniemi, H.; Stacey, A.; Shikata, H.; Baldwin, C.T.; Jaenisch, R.; Frock, Bibchem. J. 253, 1919-22, 1988
A; Title: Structure of a full-length CDNA clone for the prepro-alpha-1(I) chain of human the A; Reference number: S0143; MUID: 89025644; PMID: 3178743
A; Accession: S01143
A; Molecule type: mRNA
A; Residues: 1-472 < TRO
A; Cross-references: EMBL: X07884; NID: 930015; PIDN: CAA30731.1; PID: 930016; GB: M36546; NID
A; Residues: submitted to the EMBL/GenBank/DDBJ databases by Prockop, D.J., 13-UN-1988
R; Chu, M.L.; de Wet, W.; Bernard, M.; Ding, J.F.; Morabito, M.; Myers, J.; Williams, C.; Nature 310, 337-340, 1984
A; Title: Human proalpha1(I) collagen gene strücture reveals evolutionary conservation of A; Reference number: A93335; MUID: 84270697; PMID: 6462220
A; Andression: A93335; MUID: 84270697; PMID: 6462220
A; Andression: A933355; MUID: 84270697; PMID: 6462220

A; Molecule type: DNA A; Residues: 1-58, Q', 60-181 «CHU> A; Cross-recences: EMBL:X00820; NID:935657; PIDN:CAA25394.1; PID:935658 A; Cross-recences: EMBL:X00820; NID:935657; PIDN:CAA25394.1; PID:935658 B; Rossouw, C.M.S.; Vergeer, W.P.; du Plooy, S.J.; Bernard, M.P.; Ramirez, F.; de Wet, W.L. A; Biol. Chem. 262, 15151-15157, 1987 A; Title: DNA sequences in the first intron of the human pro-alpha 1(I) collagen gene enh? A; Reference number: 155254; MUID:88033098; PMID:822714 A; A; Accession: 155254

A;Status: translation not shown; translated from GB/EMBL/DDBJ

A; Molecule type: DNA A; Mesidues: 1.45 = ROS> A; A; Residues: 1.45 = ROS> A; Cross-references: GB:J02829; NID:g180387; PIDN:AAAS1993.1; PID:g180388 A; Cross-references: GB:J02829; NID:g180387; PIDN:AAAS1993.1; PID:g180388 R; Bornstein, P.; McKay, J.; Morishima, J.K.; Devarayalu, S.; Gelinas, R.E. R; Bornstein, P.; McKay, J.; Morishima, J.K.; Devarayalu, S.; Gelinas, R.E. A; Title: Regulatory elements in the first intron contribute to transcriptional control of A; Reference number: A39943; MUID:88097389; PMID:3480516

A;Molecule type: DNA A;Residues: 1-34 ABOR> A;Cross-references: GB:J03559; NID:g180876; PIDN:AAA52052.1; PID:g553238 R;Chu, M.L.; de Wet, W.; Bernard, M.; Ramirez, F.

(1

```
A; Molecule type: mRNA

A; Molecule type: mRNA

A; Residues: 425-1326, X; 1252-1328, S; 1330-1390, X; 1392-1464 «BER>

A; Cross-references: GB: K01228; NID: g180391; PIDN: AAA51995.1; PID: g180392

A; Note: sequence partially completed for missing nucleotides by A29439

B; Chu, M.L.; Gargiulo, V.; Williams, C.J.; Ramirez, F.

J; Biol. Chem. 260, 691-694, 1985

A; Title: Multiexon deletion in an osteogenesis imperfecta variant with increased type III

A; Reference number: A22161; MUID: 85104934; PMID: 2981843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: mRNA
A; Residues: 710-720, E', 722-737, E', 739-745 < WAL>
A; Residues: 710-720, E', 722-737, E', 739-745 < WAL>
A; Note: the authors translated the codons CAG for 721 and CGT for 738 as Glu
R; Forlino, A.; Zolezzi, F.; Valli, M.; Pignatti, P.F.; Cetta, G.; Brunelli, P.C.; Mottes,
Hum. Mol. Genet. 3, 2201-2206, 1994
A; Title: Severe (type III) osteogenesis imperfecta due to glycine substitutions in the ce
A; Reference number: 154365; MUID:95187161; PMID:7881420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A.Experimental source: fetal cell 88-251
R.Cohn, D.H.; Apone, S.; Eyre, D.R.; Starman, B.J.; Andreassen, P.; Charbonneau, H.; Nick, B.J., Chem. 263, 14605-14607, 1988
A.Title: Substitution of Cysteine for Glycine within the Carboxyl-terminal Telopeptide of A.Reference number: 155269; MUID:89008119; PMID:3170557
A.Accession: 155269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A Molecule type: DNA
MyResidues 146-766, S.,768-781 <POR>
A;Residues 146-766, S.,768-781 <POR
A;Cross-references: GB:447667; NID:91009093; PIDN:AAB59576.1; PID:91009094
B;Cross-references: GB:47667; NID:91009093; PIDN:AAB59576.1; PID:91009094
B;Chessler, S.D.; Wallis, G.A.; Byers, P.H.
A;Chessler, S.D.; Wallis, G.A.; Byers, P.H.
A;Title: Mutations in the carboxyl-terminal propeptide of the pro alpha 1(I) chain of typ.
A;Reference number: A47426; MUID:93352646; PMID:8349697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: DNA
A; Residues: 472-594, "K', 596-607 < CH3>
A; Residues: 472-594, "K', 596-607 < CH3>
A; Cross-references: GB: K03178; GB: K03179; NID: g179612; NID: g179613; PIDN: AAA51847.1; PID: A; A; Note: translated the codon CGT for residue 595 as Pro
B; Wallis, G.A.; Starman, B.J.; Zinn, A.B.; Byers, P.H.
Am. J. Hum. Genet. 46, 1034-1040, 1990
A; Title: Variable expression of osteogenesis imperfecta in a nuclear family is explained
                                                                                                                                                                                                                                                                                                                                                                                                 A,Title: Nucleotide sequences of complementary deoxyribonucleic acids for the proalphal A,Reference number: A90476; MUID:84080385; PMID:6689127
A,Accession: A90476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A,Molecule type: mRNA
A,Residues: 1179-1276, H7,1278-1336,1339-1387, 'R',1389-1464 < CHE>
A,Cross-references: GB:S64596; NID:9407589; PIDN:AAB27656.1; PID:9407590
A,Note: sequence extracted from NCBI backbone (NCBIN:136444, NCBIP:136445)
A,Note: does not represent an experimentally determined sequence but three different of A,Molecule type: mRNA
A,Accession: B47426
A,Molecule type: mRNA
A,Residues: 1179-1464 < CH4>
                                                                                         A, Deceule type: MRNA
A, Residues: 342-352, 'C', 354-359 < WI2>
A, Cross-references: GB:S64117; NID:g408195; PIDN:AAB27677.1; PID:g408196
A; Note: mutant sequence from parient with osteogenesis imperfecta
R; Bernard, M.P.; Chu, M.L.; Myers, J.C.; Ramirez, F.; Eikenberry, E.F.; Prockop,
Biochemistry 22, 5213-5223, 1983
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ;Reference number: A35336; MUID:90252792; PMID:2339700; Accession: A35336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A, Experimental source: normal dermal fibroblast culture A, Accession: C47426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A,Molecule type: mRNA
A,Residues: 1179-1276,'H',1278-1464 <CH5>
A,Experimental source: fetal cell 86-237
A,Accession: D47426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Molecule type: mRNA
Residues: 1179-1387,'R',1389-1464 <CH7>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Molecule type: mRNA
A;Residues: 1179-1336,1339-1464 <CH6>
A;Experimental source: fetal cell 86-146
          A;Accession: 152905
A;Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Accession: A22161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Accession: A47426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Accession: E47426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Molecule type: mRNA.
Residues: 156-183 <WEI>.
ACLICK, E.M.; Bornstein, P.
ACLICK, E.M.; Bornstein, P.
; A659-4706, 1970
; Title: Isolation and characterization of the cyanogen bromide peptides from the alphal
; Reference number: A90567; MUID:71038655; PMID:5529814
; Contents: CNBr0-1, CNBr2, CNBr4, CNBr5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A.Status: translated from GB/EMBL/DDBJ
A,Nolectule type: mRNA
A,Residues: 258-268;1347-1357 <- CDBA-
A,Reference number: A55, 5042-5048; 1970
A,Ritle: Comparative study of glycopeptides derived from selected vertebrate collagens.
A,Reference number: A92069; MUID:71001508; PMID:4319110
A,Residues: 263-268 <- ROR>
A,Residues: 263-268 <- ROR>
                                                                                                                                                                                                                                                                                                                                            A;Cross-references: GB:M10627; NID:g180383; PIDN:AAA51992.1; PID:g553226
Wintez, M.K.; Keene, D.R.; Howir, H.; Glanville, R.W.; Steinmann, B.; Rao, V.H.; Hollist
J. Biol. Chem. 265, 6312-6317, 1990
A;Title: In vivo and in vitro noncovalent association of excised alpha1(I) amino-termina
A;Reference number: A35233; MUID:90202908; PMID:2318855
A;Accession: A35233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Molecule type: protein
Residues: 162-198, Z', 200-201, Z', 203-206, Z', 208-209, Z', 211-228, B', 230, BB', 233, Z'
Residues: 162-198, Z', 200-201, Z', 203-206, Z', 208-209, Z', 211-228, B', 230, BB', 233, Z'
Residues: local source: skin
Residues: evidence for 170-allysine
Baetge, B.; Notbohm, H.; Diebold, J.; Lehmann, H.; Bodo, M.; Deutzmann, R.; Mueller, F
Rattes, B.; Notbohm, B3: 153-159, 1990
Intile: A critical crosslink region in human-bone-derived collagen type I. Specific cle
Reference number: S11372; MUID:90382436; PMID:2169412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: protein

A; Molecule type: protein

A; Molecule type: protein

A; Residuces: 175-187; 274-287, 'P', 289 cBAB>

A; Residuces: 175-187; 274-287, 'P', 289 cBAB>

A; Note: sequence of collagen alpha 1(S)(I) isolated from bone after pepsin digestion

R; Deak, S.B.; Scholz, P.M.; Amenta, P.S.; Constantinou, C.D.; Levi-Minzi, S.A.; Gonzalez

A; Diol. Chem. 266, 21827-21832, 1991

A; Title: The substitution of arginine 10 glycine 85 of the alpha 1(I) procollagen chain opperative melting of intact type I collagen.

A; Reference number: 155342; MUID:92042092; PMID:1718984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                딩
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A,Molecule type: protein
A,Residues: 33-52 WIR>
A,Residues: 41-52 WIR>
A,Note: this propeptide fragment remained non-covalently bound to a defective, uncleaved A,Note: this propeptide fragment remained Not. W.; Cole, W.G.; Chan, D.; Bateman, J.F. EMBO J. 8, 1705-1710, 1989
A,Title: A base substitution in the exon of a collagen gene causes alternative splicing A,Reference number: $09400; MUID:89356643; PMID:2767050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A,Molecule type: mRNA
A,Residues: 281-302,402-420;823-843;925-944;1026-1045;1143-1162 <LAB>
A;Residues: 281-302,402-420;823-843;925-944;1026-1045;1143-1162 <LAB>
Connect: M.K.; Rao, V.H.; Glanville, R.W.; Labhard, M.E.; Pretorius, P.J.; de Vries, W.N.
Connect: Tissue Res. 29, 1-11, 1993
A,Title: A cysteine for glycine substitution at position 175 in an alpha 1 (I) chain of
A,Reference number: 152905; MUID:93339042; PMID:8339541
. Biol. Chem. 260, 2315-2320, 1985
. Fitle: Fine structural analysis of the human pro-alpha 1 (I) collagen gene. Promoter Keference number: 155237; MUID:85130970; PMID:2857713
Accession: 155237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Title: Segmental amplification of the entire helical and telopeptide regions of the A;Reference number: $15989; MUID:90326017; PMID:2374517 A;Accession: $15989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A, Experimental source: skin
A) Note: attachment of 2-0-alpha-D-glucosyl-0-beta-D-galactose to 5-hydroxylysine
R, Labhard, M.E.; Hollister, D.W.
Matrix 10, 124-130, 1990
                                                                                                         A;Reference number: 155237; MÜID:85130970; PMID:2857713
A;Accession: 155237
A;Status: translation not shown; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
                                                                                                                                                                                                                                                        Molecule type: DNA
Residues: 1-34 <CH2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Accession: S11372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Accession: S09400
```

mute

COV

```
A)Accession: A90566
A)Accession: A90566
A)Residues: 103-139 <BU2>
A)Experimental source: skin
B)Chemistry 10, 4470-4478, 1971
B)Chemistry 10, 4470-4478, 1971
B)Chemistry 10, 4470-4578, 1971
B)Chemistry 10, 5470-4578, 1971
B)Chemistry 10, 5470-4578, 1971
B)Chemistry 10, 5470-4578, 1971
B)Chemistry 10, 5470-5779
B)Chemistry 10, 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Molecule type: protein.

"Residues: 239-418 kBA2."

"Residues: 239-418 kBA2."

"Residues: 239-418 kBA2."

"Residues: 239-418 kBA2."

"Butler, W.T.; Underwood, S.P.; Finch Jr., J.E.

"Jochemistry 13, 2946-2953, 1974

"Title: Chemical studies on the cyanogen bromide peptides of rat skin collagen. Amino activates number: A90379; MUID:74271984; PMID:4366532.

"Contents: CNBr3."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ristoltz, M.; Timpl, R.; Furthmayr, H.; Kuehn, K.
Eur. J. Biochem. 37, 287-294, 1973
A; Title: Structural and immunogenic properties of a major antigenic determinant in neutr.
A; Reference number: A91209; MUID:74011954; PMID:4126850
A; Contents: CNBr6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A,Note: the composition of pertides comprising residues 1-9 and 1-19 confirms the sequency. A,Note: this region (residues 651-671 above) probably corresponds to positions 1032-1052 c)comment: Prolines and lysines at the third position of the tripeptide repeating unit (c) a comment: Prolines and lysines at the third position of the tripeptide repeating unit (c) comment: Proceed and subsequently 0-glycosylated.

C,Comment: The complete chain contains 1052 residues.
C,Comment: The complete chain contains 1052 residues.
C,Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxyl-terminal homology; F;1/Modified site: blocked amino end (Glx) (probably pyrrolidone carboxylic acid) #status F;1/Modified site: allysine (Lys) #status experimental
F;103/Modified site: carbohydrate (Lys) (covalent) #status experimental
F;424,547/Modified site: 5-hydroxylysine (Lys) (partial) #status experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Balian, G.; Click, E.M.; Hermodson, M.A.; Bornstein, P.
iochemistry 11, 3798-3806, 1972
Title: Structure of rat skin collagen alphal-CB8. Amino acid sequence of the hydroxylam Reference number: A90362; MUID:73006942; PMID:4342027
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Note: this region probably corresponds to positions 949-1032 of the alpha 1(I) chain A;Note: the major antigenic determinant (of neutral salt-extracted rat skin collagen) in:
                                                                                                                                            rat skin collagen. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 1118; DB 1; Length 671; Pred. No. 1.9e-55;
                                                                                   Biochemistry 9, 44-50, 1970
A;Title: Chemical studies on the cyanogen bromide peptides of
A;Reference number: A90566; MUID:70085124; PMID:5411206
A;Contents: CNBr5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ;Stoltz, M.; Timpl, R.; Kuehn, K.
TEBS Lett. 26, 61-65, 1972
.yTitle: Non-helical regions in rat collagen alphal-chain.
;Reference number: A91385; WUID:73049495; PMID:4636751
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   94.4%;
90.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Accession: A90379
A;Molecule type: protein
A;Residues: 419-567 <BU3>
A;Experimental source: skin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A, Molecule type: protein
A, Residues: 568-651 <ST1>
A, Experimental source: skin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Molecule type: protein;
Residues: 651-671 <ST2>
Experimental source: skin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Experimental source: skin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Molecule type: protein; Residues: 140-238 <BA1>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Accession: A90362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Accession: A91209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Accession: A91385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Accession: A90357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 2
CONTAGE AT A CONTAGE AND A CONTAGE A CONTAGE AND A CONTAGE A CONTAGE AND A CONTAGE A CONTAGE AND A CONTAGE A CONTAGE AND A CONTAGE A CONTAGE AND A CONTAGE A CONTAGE AND A CONTAGE A CONTAGE A CONTAGE AND A CONTAGE AND A CONTAGE AND A CONTAGE AND 
A;Status: translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 1187-1194, CC,1196-1220 <COH>
A;Koss-references: GB:M23213; NID:g340842; PIDN:AABS9363.1; PID:g499622
A;Cross-references: GB:M23213; NID:g340842; PIDN:AABS9363.1; PID:g499622
A;Note: mutant sequence from a patient with mild osteogenesis imperfecta
R;Mackelae, JK:; Rasassia, M; Virta, A; Vuorio, E.
Nucleic Acids Res. 16, 349, 1988
A;Title: Human pro-alpha-1(I) collagen: cDNA sequence for the C-propeptide domain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                518 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPRGARGQA 577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           109 GVMGPPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     tch al Similarity 93.6%; Score 1149; DB 1; Length 1464; al Similarity 93.6%; Pred. No. 6.7e-57; 206; Conservative 0; Mismatches 2; Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 638 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            49
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Best Local
Matches 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ઠે
```

us-10-658-989a-1.rpr

4

Page

```
109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          627
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 4 .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       심
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A,Accession: A23982
A;Molecule type: mRNA
A;Molecule type: mRNA
A;Molecule type: mRNA
A;Residuces: 518-1128 <FRE>
A;Cross-references: 618-M14423; NID:g192261; PIDN:AAA37333.1; PID:g192262
B;Monson, J.M.; Friedman, J.; McCarthy, B.J.
Mol. Cell. Biol. 2, 1362-1371, 1982
A;Title: DNA sequence analysis of a mouse pro-alpha-1(I) procollagen gene: Evidence for A;Reference number: 149559; MUID:83141374; PMID:6298597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of alphal(I) collagen gene leads
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              collagen mRNAs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           collagen alpha 1(I) chain precursor - mouse
C;Species: Mus musculus (house mouse)
C;Dete: 13-Jan-1995 #sequence revision 25-Apr-1997 #text_change 13-Aug-1999
C;Date: 13-Jan-1995 #sequence revision 25-Apr-1997 #text_change 13-Aug-1999
C;Accession: S57243; S16374; A22982; I49559; I49557; S39789; I48300; S21626
R;Li, S.W.; Khillan, J.; Prockop, D.J.
Matrix Biol. 14, 593-595, 1994
A;Title: The complete cDNA coding sequence for the mouse pro-alpha-1(I) chain of type
A;Reference number: S57243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Accession: S16374
A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1442-1453 «MET>
A;Cross-references: EMBL:X57981; NID:g50484; PIDN:CAA41046.1; PID:g50485
A;Cross-references: EMBL:X57981; NID:g50484; PIDN:CAA41046.1; PID:g50485
A;Cross-references: W.H.; Maul, G.G.
Gene 39, 311-312, 1988
A;Title: Nucleotide sequence of a cDNA clone for mouse proalphal(I) collagen protein.
A;Reference number: A23982; MUID:86137403; PMID:3841523
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A)Cross-references: GB:KO1688; NID:g192246; PIDN:AAA37330.1; PID:g553881
R;Fenton, S.P.; Lamande, S.R.; Hannagan, M.; Stacey, A.; Jaenisch, R.; Bateman, J.F.
Biochim. Biophys. Acta 1216, 469-474, 1993
A;Title: Genomic sequence of mouse COLLA1 encoding the collagen propeptides.
A;Reference number: S39789; MUID:94092741; PMID:8268229
      ä
                                                                                                                                                                                 108
                                                                                               ||||
296 GPPGPAGEEGKRGARGEPGPSGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 355
                                                                                                                                                                                                                                           415
                                                                                                                                                                                                                                                                                                          168
                                                                                                                                                                                                                                                                                                                                       416 GVMGFPGPKGTAGEPGKAGERGVPGPPGAVGPAGKDGBAGAQGAPGPAGPAGPAGERGEQGPA 475
                                                               48
                                                            GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                              GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                    356 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGZBGRPGPAGPPGARGQA
                                                                                                                                                                                                                                                                                                109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEOGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Residues: 1-1453 <LIS>
A;Cross-references: EMBL:U08020; NID:g470673; PIDN:AAA88912.1; PID:g470674
A;Cross-references: EMBL:U08020; NID:g470673; PIDN:AAA88912.1; PID:g470674
A;Metsearanta, M.; Toman, D.; de Crombrugghe, B.; Vuorio, E.
Biochim. Biophys. Acta 1089, 241-243, 1991
A;Title: Specific hybridization probes for mouse type I, II, III and IX co.
A;Reference number: S16176; MUID:91274355; PMID:2054384
      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Cross-references: GB:MI7491; NID:g192263; PIDN:AAA37334.1; PID:g192264 R;Harbers, K.; Kuehn, M.; Delius, H.; Jaenisch, R. Proc. Natl. Acad. Sci. U.S.A. 81, 1504-1508, 1984 A;Title: Insertion of retrovirus into the first intron of alphal(I) colls A;Reference number: I49557; MUID:84170331; PMID:6324198
      12;
      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
   2:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 735-1130 <RES>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary; translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residues: 1-25 <RE2>
   Mismatches
   2
   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Molecule type: mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Accession: S57243
198;
                                                            -
                                                                                                                                                                              49
                                                                                                                                                                                                                                                                                                                                                                                                                      169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               476
   Matches
                                                         à
                                                                                                           g
                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                           ò
```

A; Accession: S39789

```
,1223-13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Aintrons: 770/3; 788/3; 806/3; 842/3; 860/3; 878/3; 912/3; 968/3; 1004/3; 1022/3; 1058/? (Superfamily: collagen alpha 1(I) chain, fibrillar collagen carboxyl-terminal homology; C; Superfamily: colled coil; extracellular matrix; glycoprotein; heterotrimer; triple helix F;1-22/Domain: signal sequence #status predicted <SIG> F;23-151/Domain: amino-terminal propeptide #status predicted <PRO> F;30-89/Domain: von Willebrand factor type. C repeat homology <PRO> F;152-1453/Product: collagen alpha 1(I) chain #status predicted <AMGT> F;1224-1453/Domain: fibrillar collagen carboxyl-terminal homology <PCC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A, Accession. A90181
A; Molecule type: protein
C; Comment: Lysines at positions 103, 700, 934, and 946 above may be hydroxylated in some
C; Comment: Most of the prolines at the third position of the tripeptide repeating unit (C, Comment: Pro-1002 is the only 3-hydroxyproline and the only hydroxylated proline in position to the tripeptide repeating unit (C, Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxylated proline in position to the tripeptide are provided coil; extracellular matrix, glycoprotein, pyroglutamic acid; trimer; the profiled site: pyrrolidone carboxylic acid (Gln) #status experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: protein
A; Residues: 1-1036 <HIG>
A; Residues: 1-1036 <HIG>
A; Experimental source: SM.
A; Note: this is the latest in a series of papers from these workers elucidating the seque R; Eyre, D.R.; Glimcher, M.J.
B; Eyre, D.R.; Glimcher, M.J.
A; Title: Blobbys. Res. Commun. 48, 720-726, 1972
A; Title: Evidence for a previously undetected sequence at the carboxyterminus of the alph A; Reference number: A90181; MUID:72243016; PMID:5047697
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Species: Gallus gallus (chicken)
C;Date: 12-Aug-1981 #sequence_revision 06-Jul-1982 #text_change 31-Mar-2000
C;Date: 12-Aug-1981 #sequence_revision 06-Jul-1982 #text_change 31-Mar-2000
C;Accession: A90458; A90181; A02857
C;Accession: A90458; A90181; Dixit, S.N.; Yu, W.; Seyer, J.M.; Kang, A.H.; Gross, J. Biochemistry 21, 2048-2055, 1982
A;Title: Amino acid sequence of chick skin collagen alphal(I)-CB8 and the complete primax
A;Reference number: A90458; MUID:82231995; PMID:7093229
                                                                                                                                                                                                                     an indirect
A; Molecule type: DNA
A; Residues: 1-80, 'E', 82-105,'D',107-185;1031-1201,'G',1203-1218,'E',1220-1221,'T',
R; Rhodes: K.; Rippe, R.A.; Umeray, A.; Nehls, M.; Brenner, D.A.; Breindl, M.
Mol. Cell. Biol. 14, 5950-5960, 1994
A; Title: DNA methylation represses the murine alpha 1(1) collagen promoter by an i
A; Accession: 148300; MUD:94344105; PMID:8065328
A; Accession: 148300; MUD:94344105; PMID:8065328
A; Molecule type: DNA
A; Molecule type: DNA
A; Molecule type: DNA
A; Molecule type: DNA
A; Cross-references: EMBL:X54876; NID:550486; PIDN:CAA38657.1; PID:950487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ï
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           447 GPPGPAGEEGKRGARGEPGPSGLPGPPGERGGPGSRGFPGADGVAGPKGPSGERGAPGPA 506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                507 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGKTGPPGPAGQDGRPGPAGPPGARGQA 566
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     567 GVMGFPGPKGTAGEPGKAGERGLPGPPGAVGPAGKDGEAGAQGAPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                collagen alpha 1(1) chain - chicken (tentative sequence) (fragments)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1116; DB 2; Length 1453;
Pred. No. 4.5e-55;
1; Mismatches 5; Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSPGFQGLPGPAGPGEAGKPGEQGVPGDLGAPGPSGARG 666
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          4,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity 90.5%;
Matches 199; Conservative 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Accession: A90458
```

Ŋ

ВB

```
A;Cross-references: EMBL:X16711; NID:g30040; PIDN:CAA34683.1; PID:g30041
A;Note: alternative splice form 1
B;Ryan, M.C.; Sandell, L.J.
J. Bhol. Chem. 265, 10334-10339, 1990
A;Title: Differential expression of a cysteine-rich domain in the amino-terminal propept. A;Reference number: A35428; MUD:90285153; PMID:2355003
A;Accession: A35428; MUD:90285153; PMID:2355003
A;Accession: A35428; MUD:90285153; PMID:2355003
A;Accession: A35428; MUD:90285163; PMID:2355003
A;Accession: A3741, L, 483-103 < RYA2>
A;Accession: A18-441, 1989
A;Note: alternative splice form 2; splicing appears to be under developmental regulation R;Su, M.W.; Benson-Chanda, V; Vissing, H.; Ramirez, F.
Genomics 4, 438-441, 1989
A;Title: Organization of the exons coding for Pro alpha-1(II) collagen N-propeptide conf. A;Reference number: A30147; MUID:89233138; PMID:2714801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Molecule type: protein
A;Residues: 188-189, Xx, 191-195;1224-1230, Xx, 1232-1236 <DIA>
R;Franc, S.; Marzin, E.; Boutillon, M.M.; Lafont, R.; Lechene de la Porte, P.; Herbage,
Bischem. 234, 125-131, 1995
A;Title: Immunohistochemical and biochemical analyses of 20000-25000-year-old fossil car
A;Reference number: S63514; MUID:96096730; PMID:8529631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Molecule type: DNA
A;Residues: 630-640, Av, 642-785 <VIK2>
A;Cross-references: EMBL;X16158; NID:g29951; PIDN:CAA34278.1; PID:g1335018; PIDN:CAA3427
PIDN:CAA34283.1; PID:g1335023; PIDN:CAA34284.1; PID:g1335024
R;Bogaert, R.; Tiller, G.E.; Weis, M.A.; Gruber, H.E.; Rimoin, D.L.; Cohn, D.H.; Eyre, D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          U. Biol. Chem. 267, 22522-22526, 1992
A;Title: An amino acid substitution (Gly853-->Glu) in the collagen alpha 1(II) chain pro A;Reference number: A44309; MUID:93054548; PMID:1429602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Accession: A33116
A;Molecule type: DNA
A;Residues: 171-172, C', 174-175 <ALA>
A;Residues: 171-172, C', 174-175 <ALA>
A;Note: mutant sequence from a family with family with primary generalized osteoarthriti
R;Diab, M; Wu, J.J; Byre, D.R.
Biochem. J. 314, 327-332, 1996
A;Title: Collagen type IX from human cartilage: a structural profile of intermolecular c
A;Reference number: S64673; MUID:96195147; PMID:8660302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (COL2A1) as a cause of pri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: protein
A; Residues: 243-261;575-590;756-763, XX,765-779 <FRA>
A; Tiller, G.E.; Weis, M.A.; Polumbo, P.A.; Gruber, H.E.; Rimoin, D.L.; Cohn, D.H.; Eyre, A; Tiller, An RNA-splicing mutation (G+SIV820) in the type II collagen gene (COL2A1) in a A; Reference number: 138867; WUID:95150028; PMID:7847372
A; Reference number: 138867
A; Status: preliminary; translated from GB/EMBL/DDBJ
A; Status: preliminary; translated from GB/EMBL/DDBJ
A; Residues: 440, G', 442-456, E', 458-480, P', 482-509 <TILL>
A; Cross-references: EMBL:UI5195; NID:9557053; PIDN:AAB60370.1; PID:9557054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 104-157, P., 159-236 <SUM>
A; Residues: 104-157, P., 159-236 <SUM>
B; R; Ala-Xokko, L.; Baldwin, C.T.; Moskowitz, R.W.; Prockop, D.J.
Proc. Natl. Acad. Sci. U.S.A. 87, 565-5668, 1990
A; Title: Single base mutation in the type II procollagen gene (COL2A1) as a cause of p
A; Reference number: A94227; MUID:90370826; PMID:1975693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            compared with conceptual translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   R;Vikkula, M.; Peltonen, L.
FEBS Lett. 250, 171-174, 1989
A;Title: Structural analyses of the polymorphic area in type II collagen gene.
A;Reference number: SOSO00, MUID:89325561; PMID:2753125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ,Molecule type: mRNA
,Residues; 501-676,'A',678-763,'A',785-831,'PA',834,'F',836-1214 <RAM>
,Cross-references: EMBL:X13783; NID:g30037; PIDN:CAA32030.1; PID:g930050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A'Ramirez, F.
withmitted to the BMBL Data Library, December 1988
N'Reference number: S04892
A'Accession: S04892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A,Status: nucleic acid sequence not shown; not A,Molecule type: DNA; mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Accession: S05000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Collagen alpha 1(II) chain precursor [validated] - human
Naletrane names: procollagen alpha 1(II) chain
Nicontains: chondrocalcin; collagen alpha 1(II) chain precursor splice form 1; collagen
C; pate: 28-May-1866 #sequence revision 01-Sep-1995 #text change 08-Dec-2000
C; Accession: A38813; S06715; $23470; A48828; $36486; A35728; A30147; A33116; $64674; $63
7250; I37251; I37252; I37252; I37252; I55338; I5935; I61910
R; Ryan, M.C.; Sieraski, M.; Sandell, L.J.
Genomics 8 4.1-48, 1990
A; Title: The human type II procollagen gene: identification of an additional protein-coc
A; Reference number: A38513; MUD: 9184811; PMID: 2081599
A; Title: The human type II procollagen gene: identification of an additional protein-coc
A; Reference number: A38513; MUD: 9184811; PMID: 2081599
A; Title: The human type II procollagen gene: A; Reference number: B: MuD: 9184811; PMID: 2887267
A; Cross-reference: CB: MoCos99; NID: 9184811; PMID: 2887267
A; Cross-reference: CB: MuD: 90067946; PMID: 2887267
A; Accession: S06715
A; Mocos-reference: Muber: S06715; MUD: 90067946; PMID: 2887267
A; Accession: S06715
A; Access
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Status: translation not shown
A; Status: translation not shown
A; Molecule type: DNA
A; Molecule type: DNA
A; Molecule type: DNA
A; Molecule type: DNA
A; Note: this translation is not annotated in GenBank entry HSPROCOE1, release 111.0
A; Note: this translation is not annotated in GenBank entry HSPROCOE1, release 111.0
A; Note: this translation is not annotated in GenBank entry HSPROCOE1, release 111.0
A; Note: this translation is not annotated in GenBank entry HSPROCOE1, release 111.0
A; Reference number: A24828 MUID:87031574; PMID:3021582
A; Molecule type: DNA
A; Molecule type: DNA
A; Residumi, C.T.; Reginato, A.M.; Smith, C.; Jimenez, S.A.; Prockop, D.J.
B; Coss-references: GE: M25698; NID:9189
A; Title: Structure of cDNA clones coding for human type II procollagen. The alpha-1(II)
A; Reference number: S06496; MUID:90026318; PMID:2803268
A; Molecule type: mRNA
A; Molecule type: mRNA
A; Molecule type: mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A,Molecule type: mRNA
A,Residues: 7-28,'R',99-157,'P',159-440,'G',442-456,'E',458-640,'A',642-831,'PA',834,'F'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                alpha-1(II)
                                                                                                                                                                     ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             356 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGSPGFAGPPGPAGQDGRPGPAGPARQDA 415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                       GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                     Gaps
                                                                                                                                                                 12;
                                                                                     Length 1042;
                                                                                                                                                                 14; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           515
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAPGFOGLPGPAGPPGEAGKPGEOGVPGNAGAPGPAGARG
                                                                                     Score 1067; DB 1;
Pred. No. 1.8e-52;
4; Mismatches 14;
                                                                                     90.1%;
larity 86.4%;
Conservative
                                                                                     Query Match
Best Local Similarity
Matches 190; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                       4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q
                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
```

```
492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                503
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          쉱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
A;Residues: 752-831, 'PA',834,'F',836-1005,'K',1007-1036,'Q',1038-1052,'E',1054-1068,'T',
A;Cross-references: GB:L00977; NID:g180812; PIDN:AAB33914.1; PID:g258774
A;Note: sequence extracted from NCBI backbone (NCBIP:117273); parts of this sequence wen
A;Note: this translation is not annotated and this publication is not cited in GenBank
A;Note: mutant sequence associated with perinatal lethal hypochondrogenesis
A;Note: mutant a;Note
                                                                                                                                                                                                                                                                                                                                                                                                                                                A.Accession: S16502
A.Accession: S16502
A.Accession: DNA
A.Accession: DNA
A.Accession: DNA
A.Accession: Lid4-1184, 'GPSGKDGANGIPGPI', 1185-1199 <TIL2>
A.Cross-references: EMBL:M37126; NID:g180808; PIDN:AAA52037.1; PID:g180809
A.Cross-references: EMBL:M37126; NID:g180808; PIDN:AAA52037.1; PID:g180809
A.Accession: Accidentification and patient with spondyloepiphyseal dysplasia
R.Cheah, K.S.E.; Stoker, N.G.; Griffin, J.R.; Grosveld, F.G.; Solomon, E.
Proc. Natl. Acad. Sci. U.S.A. 82, 2555-2559, 1985
A.Accession: A02858; MUID:85190534; PMID:3857598
A.Accession: A02858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type: protein
A; Molecule type: protein
A; Nestdues: YE', 1244-1246, N', 1248, X', 1250-1265,1295-1305,1395-1408 < VAN>
A; Note: chondrocalcin identified as released collagen 1(II) chain carboxyl-terminal prop
B; Strom, C,M.; Upholt, W.B.
Notele: Cases 12, 1025-1038, 1984
A; Strom, C,M.; Upholt, M.B.
A; Title: Isolation and characterization of genomic clones corresponding to the human typ
A; Reference number: A21733; MUID: 84118798; PMID: 6320112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Molecule type: DNA
A;Residues: 1245-1295 <STR1>
A;Cross-references: EMBL:X00339; EMBL:X00298; NID:g394699; PIDN:CAA25092.1; PID:g4378975
A;Accession: B21733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                prd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1296-1358 cMUN2>
A; Residues: 1296-1358 cMUN2>
A; Residues: 1296-1358 cMUN2>
A; Residues: 1296-1358 cMUN2>
A; A; Note: this translation is not annotated in GenBank entry HUMCCT2A, release 111.0
A; Note: this translation is not annotated in GenBank entry HUMCCT2A, release 111.0
A; Note: the codons given for 1333-Lys (AcG) and 1350-Gly (GCA) are inconsistent with the R; Sandjorgi, F.O.; Benson-Chanda, V.; de Wet, W.J.; Sobel, M.E.; Tsipouras, P.; Ramirez, Nucleic Acids Res. 13, 2207-2225, 1985
Nucleic Acids Res. 13, 2207-2225, 1985
A; Accession: S59491
A; Reference number: 137249; MUID:85215609; PMID:2987845
A; Accession: S59491
A; Residues: 7-28; RV, 99-114;541-578;786-802;1055-1056, N', 1058-1068, 'T', 1070-1109;1200-1
A; Residues: translated from GB/EMBL/DDBJ
A; Residues: 7-28 cSAN2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A, Molecule type: DNA
A, Residues: 1032-1056, Nv, 1058-1068, Tr, 1070-1487 < CHE>
A, Residues: 1032-1056, Nv, 1058-1068, Tr, 1070-1487 < CHE>
A, Cross-references: GB:JOUIL6; NID:G180395; PIDN:AAA51997.1; PID:g180396
R, Elima, K.; Vuorio, T.; Vuorio, E.
Nucleic Acids Res. 15, 9499-9504, 1387
A, Tille: Determination of the single polyadenylation site of the human pro-alpha-1(II)
A, Reference number: A27280; MUID:88067771; PMID:2825137
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A,Residues: 894-909, PE/ <STR2>
A,Cross-references: 894-909, PE/ (STR2)
A,Cross-references: GB:K01785; NID:g30035; PIDN:CAA25082.1; PID:g1335032
R;Nunez, AM.; Francomano, C.; Young, M.F.; Martin, G.R.; Yamada, Y.
Bjochemistry 24, 6343-6348, 1985
A;Title: Isolation and partial characterization of genomic clones coding for a human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: DNA; mRNA
A; Residues: 1175-1487 <ELI>
A; Cross-references: EMBL:X06268; NID:930096; PIDN:CAA29604.1; PID:930097
A; Experimental source: fetal epiphyseal cartilage
R; van der Rest, M.; Rosenberg, L.C.; Olsen, B.R.; Poole, A.R.
Biochem. J. 237, 923-925, 1986
A; Title: Chondrocalcin is identical with the C-propeptide of type II procollagen.
A; Reference number: A57033; MUID:87099927; PMID:3800925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Reference number: A24561; MUID:86104139; PMID:3002437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: A21733
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: A24561
```

```
Collagen alpha 1(II) chain precursor [imported] - horse

N.Alternate names: type II collagen

N.Alternate names: type II collagen

C.Species: Equae caballus (domestic horse)

C.Accession: T45467

R.Richardson, D.W.; Dodge, G.R.

R.Richardson, D.W.; Dodge, G.R.

Submitted to the EMBL Data Library, June 1996

A.Description: Cloning of equine type II collagen and modulation of its expression in equal parameter and modulation of its expression in equal parameter and modulation of its expression in equal parameter in the state of translated from GB/EMBL/DDBJ

A.Reference number: 222977

A.Residues: preliminary; translated from GB/EMBL/DDBJ

A.Molecule type: mRNA

A.Molecule type: mRNA

A.Residues: 1-1418 - RIC>

A.Residues: 1-1418 - RIC>

A.Coss.references: EMBL: U62528; PIDN:AAB05773.1

C; Superfamily: collagen alpha 1(I) chain; fibrillar collagen carboxyl-terminal homology;
A;Cross-references: GB:M23759; NID:g180845; EMBL:X03320; GB:M24938; NID:g30104
A;Note: the GenBank PID is based on an incorrect reading frame
A;Accession: 137250
A;Status: translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Molecule type: DNA
A;Cross-references: EMBL:X02378; GB:M23870; NID:g30107; PIDN:CAA26227.1; PID:g929621
A;Accession: 137251
                                                                                                                                                                                                                                                                                                                                                  ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       551
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           602
                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                GEPGLPGARGLTGRPGDAGPQGKVGPSGAPGEDGRPGPPGPPGPPGPPGPPGVMGFPGPKGAN
                                                                                                                                                                                                                                                                                                                                                                                                         1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            552 GEPGLPGARGLTGRPGDAGPQGKVGPSGAPGEDGRPGPPGPQGARGQPGVMGFPGPKGAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                  ·.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ô
                                                                                                                                                                                                                                                                                 Length 1487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 1418;
                                                                                                                                                                                                                                                                                                                                               43; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B40333 collagen alpha 1(II) chain precursor - African clawed frog C;Species: Xenopus laevis (African clawed frog)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           44;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    72.6%; Score 860; DB 2;
llarity 74.0%; Pred. No. 6.4e-41;
Conservative 10; Mismatches 44;
                                                                                                                                                                                                                                                                                 72.8%; Score 862; DB 1;
74.0%; Pred. No. 5.1e-41;
iive 11; Mismatches 43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   672 GPPGEGGKPGDQGVPGEAGAPGLVGPRG 699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   630
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPPGEGGKPGDÓGVPGEAGAPGLVGPRG
                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity 74.0%
Matches 154; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
es 154; Conserv
```

```
RESULT 9

A41182

collate: 28-May-1912 #sequence_revision 28-May-1992 #text_change 13-Aug-1999

C; Date: 28-May-1992 #sequence_revision 28-May-1992 #text_change 13-Aug-1999

R; Metsacanta, M.: 7coman, D.; de Crombrugghe, B.; Vuorio, E.

A; Reference number: A41182; MUID:91358489; PMID:1885613

A; Recession: A41182

A; Residues: 1-1419 *MET>

A; Residues: 1-1419 *MET>

A; Residues: 1-1419 *MET>

A; Cross-references: GB:M65161

A; Cross-references: GB:M65161

A; Cross-references: GB:M65161

A; Cross-references: GB:M65161

A; Cross-reference number: A44885; MUID:91347939; PMID:1879363

A; A; Reference number: A44885; MUID:91347939; PMID:1879363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-references: GB:W65161
C;Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxyl-terminal homology;
C;Keywords: alternative splicing; coiled coil; extracellular matrix; glycoprotein; trime:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Accession: A44885
A; Molecule type: DNA
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             exon structure, and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61 GEAGLPGAKGLIGSPGSPGPDGKIGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    543
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         544 GEPGKAGEKGLAGAPGLRGLPGKDGETGAAGPPGPSGPAGERGEQGAPGPSGFQGLPGPP 603
    919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B41182
collagen alpha 1(II) chain precursor (long splice form) - mouse
cylagen alpha 1(II) chain precursor (long splice form) - mouse
Cyspecies: Mus musculus (house mouse)
Cyspecies: May-1992 #sequence_revision 28-May-1992 #text_change 16-Jul-1999
Cyaccession: B41182
R;Metsaeranta, M.; Toman, D.; de Crombrugghe, B.; Vuorio, E.
J. Biol. Chem. 266, 16862-16869, 1991
A;Title: Mouse type II collagen gene. Complete nucleotide sequence, exon st.
A;Reference number: A41182; MUID:91358489; PMID:1885613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       617 GEPGKAGEKGLGGAPGLRGLPGKDGETGAQGPNGPAGPAGERGEQGPPGPSGFQGLPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          424 GARGEPGGAGPIGPPGERGAPGNRGFPGQDGLAGPKGAPGERGPSGLAGPKGANGDPGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGBAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1419;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             compared with conceptual translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    46; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 70.9%; Score 839; DB 2; Best Local Similarity 72.1%; Pred. No. 9.3e-40; Matches 150; Conservative 12; Mismatches 46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           604 GPPGEGGKQGDQGIPGEAGAPGLVGPRG 631
                                                                                                                                                              704
                                                                                                                                 617 GSPGEGGKPGDQGVPGEAGAAGLVGPRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                   181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A, Accession: B41182
A, Status: preliminary; not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: DNA
A; Residues: 1-1487 <MET>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Вþ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
            셤
                                                                                       ઠે
                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cilgen alpha 1'(II) chain precursor - African clawed frog
C;Species: Xenopus laevis (African clawed frog)
C;Species: Afolds
R;Su, M.W.; Suzuki, H.R.; Bieker, J.J.; Solursh, M.; Ramirez, F.
J. Call Biol. 115, 565-575, 1991
A;Title: Expression of two nonallelic type II procollagen genes during Xenopus laevis em A;Reference number: A40333
A;Status: nucleic acid sequence not shown
A;Molecule type: mRNA
A;Residues: 1-1492 csUA>
C;Repression: Apina; Spessented as substitutions relative to another sequence in a fines they replace; the appropriate interpretation of the sequence figure was reconstructed C;Superfamily: collagen alpha I(I) fhain; fibrillar collagen alpha I(I) fhain; fibrillar callagen the carboxyl-terminal homology; C;Reprords: coiled coil; extracellular matrix; glycoprotein; trimer; triple helix F;37-96/Domain: von Willebrand factor type C repeat homology cWC>
F;1263-1492/Domain: fibrillar collagen carboxyl-terminal homology cFC>
                                                                                                                                                                          e
E
                                                                                                                                                                                                                                                                                                                                                                                                                                                 homology
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999 C;Accession: B4033
R;Su, M.W.; Suzuki, H.R.; Bieker, J.J.; Solursh, M.; Ramirez, F.
J. Cell Biol. 115, 565-575, 1991
A;Title: Expression of two nonallelic type II procollagen genes during Xenopus laevis 6A;Recession: B40333
A;Accession: B40333
A;Accession: B40333
A;Accession: B40333
A;Suzus: preliminary
A;Wolecule type: mRNA
A;Wolecule type: mRNA
A;Residues: 1-1486 cSUA
A;Coss-references: GB:W63595
C;Superfamily: collagen alpha 1(I) chain; fibrillar collagen carboxyl-terminal homology
C;Superfamily: collagen alpha 1(I) chain; glycoprotein; trimer; triple helix
F;37-96/Domain: von Willebrand factor type C repeat homology cWC>
F;1258-1486/Domain: fibrillar collagen carboxyl-terminal homology cPC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         497 GARGEPGAAGPLGPPGERGAPGNRGFPGQDGLAGPKGAPGERGVPGLGGPKGGNGDPGRP 556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    614 GEPGKAGEKGLVGAPGLRGLPGKDGETGSQGPNGPAGPAGERGEQGPPGPPGFPP 673
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 494 GARGEPGAAGPNGPPGERGAPGNRGFPGQDGLAGPKGAPGERGVPGLGGPKGGNGDPGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPGEPGPTGLPGPPGERGCPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 1492;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
71.8%; Score 850; DB 1; Length 1486;
Best Local Similarity 73.1%; Pred. No. 2.4e-40;
Matches 152; Conservative 11; Mismatches 45; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                46; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 847; DB 2;
Pred. No. 3.5e-40;
9; Mismatches 46;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPGEGGKPGDQGVPGEAGAPGLVGPRG 701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             71.5%;
73.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               al Similarity
153; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S:
Matches 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
```

```
ö
                                                                                                                                                       551
                                                                                                                                                                                     GBAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                       121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                           9
                                                                                                                   1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                         492 GARGEPGGAGPIGPPGERGAPGNRGFPGODGLAGPKGAPGERGPSGLAGPKGANGDPGRP
                                                                                     Gaps
F;33-91/Domain: von Willebrand factor type C repeat homology <VWC>F;1259-1487/Domain: fibrillar collagen carboxyl-terminal homology <FCC>
                                                                                     ő
                                                                                     46;
                                                 70.9%; Score 839; DB 2; 72.1%; Pred. No. 9.6e-40; ive 12; Mismatches 46,
                                                                                                                                                                                                                                                                                                                       181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                           GPPGEGGKQGDQGIPGEAGAPGLVGPRG 699
                                                                   Best Local Similarity 72.1
Matches 150; Conservative
                                                   Query Match
                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                       672
                                                                                                                                              g
                                                                                                                                                                                                                  Db
                                                                                                                                                                                                                                                                              Ωp
                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                셤
```

collagen alpha 1(I) chain - bovine (tentative sequence) (fragments)
C;Species: Bos primigenius taurus (cattle)
C;Date: 24-Apr-1984 #sequence revision 31-Dec-1993 #text change 31-Mar-2000
C;Date: 24-Apr-1984 #sequence revision 31-Dec-1993 #text change 31-Mar-2000
C;Accession: A91193; A91299; A91387; A91211; A91201; A91200; A43048; A02853
R;Rauterberg, J; Timpl, R.; Furthmayr, H.
Eur. J. Biochem. 27, 231-237, 1972
A;Title: Structural characterization of N-terminal antigenic determinants in calf and 1A;Reference number: A91193; MUID:72255334; PMID:4115172

A,Molecule type: protein A,Residues: 1-19 <RAU> A,Experimental source: skin

A,Note: the epsilon carbon of Lys-9, by homology with the rat alpha 1(I) chain, is conversitetzek, P.P.; Kuehn, K.
R,Fietzek, P.P.; Kuehn, K.
BLOChem. 52, 77-82, 1975
A;Title: The covalent structure of collagen: amino-acid sequence of the cyanogen-bromide A;Reference number: A91229; MUID:76022320; PMID:1164916
A;Accession: A91229

A; Molecule type: protein
A; Mesidues: 20-145 < FTES.
A; Residues: 20-145 < FTES.
A; Residues: 20-145 | FTES.
A; Note: Lys-103 is hydroxylated and binds glucosylgalactose
R; Fietzek, P.P.; Wendt, P.; Kell, I.; Kuehn, K.
B; Fietzek, P.P.; Wendt, P.; Kell, I.; Kuehn, K.
A; Fietzek, P.P.; Wendt structure of collagen: amino acid sequence of alphal-CB3 from calf
A; Reference number: A91387; MUID:73049499; PMID:4673951 A; Accession: A91387

A, Molecule type: protein
A, Residues: 146-294 < FII>>
A, Experimental source: skin
A, Experimental source: skin
B, Fietzek, P.P.; Rexrodt, F.W.; Hopper, K.E.; Kuehn, K.
Bur. J. Biochem. 38, 396-400, 1973
A, Title: The covalent structure of collagen. 2. The amino-acid sequence of alphal-CB7
A, Reference number: A91211; MUID: 74086118; PMID: 4359390

A; Molecule type: protein A; Residues: 295-562 <FI3> A;Molecule type: pr

The amino-acid sequence of the 112 residues A; Experimental source: skin
R; Wendt, P.; Mark, K.V.D.; Rexrodt, F.; Kuehn, K.
Eur. J. Blochem. 30, 169-183, 1972
A; Title: The covalent structure of collagen. The amino-a A; Reference number: A91201; MUID:73042276; PMID:4343808
A; Accession: A91201

A;Molecule type: protein A;Residues: 563-675 <WEN> A;Experimental source: skin R;Fietzek, P.P.; Rexrodt, F.W.; Wendt, P.; Stark, M.; Kuehn,

ĸ

A;Title: The covalent structure of collagen. Amino acid sequence of peptide alphal-CB6-C; A;Reference number: A91200; MUID:73042275; PMID:4343807 A)Experimental source: skin C;Comment: Lysines at positions 115, 124, 274, 346, 424, 496, 658, and 670 may be hydroxy C;Comment: Prolines in the third position of the tripeptide repeating unit (G-X-Y) are hy C;Comment: The order of the eight CNBr peptides in the alpha 1(1) chain of bovine skin or 9, 149, 268, and 217 residues. A; Accession: A91200

C.Comment: The complete chain contains 1052 residues.
C.Superfamily: collagen alpha i(i) chain; fibrillar collagen carboxyl-terminal homology;
C.Superfamily: collage alpha i(i) chain; fibrillar collagen carboxylic acid; trimer;
F.1/Modified site: pyrrolidone carboxylic acid (Gln) #status experimental Length 779; Score 824; DB 1 Pred. No. 4e-39; Query Match
Best Local Similarity 72.0%;
Matches 154; Conservative

; 9

Indels

50;

4; Mismatches

149 GPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQ 208 115 GPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQ 174 54 88 1 GPPGEPGPTGLPGPPGERGGPGS-----RGFPGADGVAGPKGPAGERGSPGPAGPKGSP GPPGAPGPQGFQGPPGEPGEPGASGPMGPRGPPGPPGRNGDDGEAGKPGRPGERGPPGPQ 55 GEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGODGRPGPPGPPGAKGQAGVMGFP 53 à 셤 ò 요 ò d

뎚

ò 원 RESULT 12

Collegen alpha 1(II) chain precursor - bovine (tentative sequence) (fragments)

Cyspecies: Bos prindgenius taurus (cattle)

Cyspecies: Bos prindgenius taurus (cattle)

Cybate: 24-Apr-1984 #sequence revision 17-May-1996 #text change 31-Mar-2000

Cyaccession: A90369; A90396; A9210; S03940; A90189; A05039; A02859

Example: E.J.; Lunde, L. G.

Biochemistry 12, 3153-3159, 1973

AyTitle: Isolation and characterization of the cyanogen bromide peptides from the alphalmaterine number: A90369; Muld: 73258693; PMID: 4732855

AyContents: composition of CNBr1 and CNBr4

ਸੂ

A; Molecule type: protein
A; Residues: 1-15 cMIL>
A; Residues: 1-15 cMIL>
A; Residues: 1-15 cMIL>
A; Residues: 1-15 cMIL>
B; Butler, W.T.; Miller, E.J.; Finch Jr., J.E.
Biochemistry 15, 3000-3006, 1976
A; Fitle: The covalent structure of cartilage collagen. Amino acid sequence of the NH-2-te
A; Reference number: A90306; MID:76253504; PMID:782511
A; Contenis: fragments CNBr2 (16-18), CNBr3 (19-21), CNBr6 (22-54), CNBr12 (55-138), and t

A,Molecule type: protein A,Residues: 16-177 <BUT> A,Experimental source: cartilage A;Accession: A90396

A, Note: order of CNBr peptides determined R; Butler, W.T.; Finch Jr., J.E.; Miller, E.

ä

Gaps

517 111 577 171 637

2

```
A; Wolecule type: protein
A; Residues: 288-291, 'P', 293-294,'X', 296-297;606,'X', 608-617 <MOR>
R; Weil, D.; Bernard, M.; Gargano, S.; Ramirez, F.
Nucleic Acids Res. 15, 181-198, 1987
Nucleic Acids Res. 15, 181-198, 1987
A; Title: The pro alpha 2(V) collagen gene is evolutionarily related to the major fibrill?
A; Reference number: A25874; MUID:87146331; PMID:3029669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        collagen conforms to the struct
                                                A;Accession: ISO694
A;Status: preliminary; translated from GB/EM3L/DDBJ
A;Molecule type: mRNA
A;Molecule type: mRNA
A;Residues: 1-886 < NAH>
A;Cross-references: EMBL:U07973; NID:g520454; PIDN:AAA83407.1; PID:g537432
C;Genetics:
A;Genetics:
A;Genetics:
C;Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxyl-terminal homology;
F;30-90/Domain: von Willebrand factor type C repeat homology <VWC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Experimental source: placenta
R;Greenspan, D.S.; Lee, S.T.; Lee, B.S.; Hoffman, G.G.
Gene Expr. 1, 29-39, 1991
A;Title: Homology between alpha2(V) and alpha1(III) collagen promoters and evidence for A;Reference number: A54555; MUID:92314691; PMID:1820205
A;Accession: A54555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Aforces references: GB:MS8529; NID:g180834; PIDN:AAC41699.1; PID:g553235
R;Moradi-Ameli, M.; Rousseau, J.C.; Kleman, J.P.; Champliaud, M.F.; Boutillon, M.M.;
Bur. J. Biochem. 22, 987-955; 1987
Fur. J. Biochem. 22, 987-955; 1987
Fur. J. Biochem. 22, 1987-955; 1987
Fur. Afritle: Diversity in the processing events at the N-terminus of type-V collagen.
A;Reference number: S43642; MUID:94237164; PMID:8181482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Collagen alpha 2 (V) chain precursor - human Collagen Homo sapiens (man)
C;Species: Homo sapiens (man)
C;Species: Homo sapiens (man)
C;Date: 31-Jul-1989 #sequence revision 28-Jul-1995 #text_change 31-Dec-2000
C;Accession: Al1427, A54555; E43643; A25874; I55239; I59025; A25374; A30017
R;Woodbury, D.; Benson-Chanda, V.; Ramirez, F.
J. Blol. Chem. 264, 2735-2738, 1989
J. Blol. Chem. 264, 2735-2738, 1989
A;Title: Amino-terminal propeptide of human pro-alpha2 (V) collagen conforms A;Reference number: A31427; MUID:89123368; PMID:2914927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               458 ĠPPGEEGKRGANGEPGQNGVPGTPGERGSPGFRGLPGSNGLPGEKGPAGERGSPGPPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        52 GSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     112 GFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Wolecule type: mRNA
A;Residues: 1-463 <WOO>
A;Cross-references: GB:J04478; NID:g179697; PIDN:AAA51859.1; PID:g179698
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A.Wolecule type: mRNA; DNA
A.Residues: 398-1496 <WEI>
A.Cross-references: GB:X04759; NID:g29588; PIDN:CAA28454.1; PID:g1340175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      6
                                                                                                                                                                                                                                                                                                                                                                                                                              DB 2; Length 886;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         172 GFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  number: A54041; MUID:94266842; PMID:8206952
                                                                                                                                                                                                                                                                                                                                                                                                                      ch 67.1%; Score 794.5; DB 2; Il Similarity 65.9%; Pred. No. 1.9e-37; Conservative 13; Mismatches 52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Experimental source: rhabdomyosarcoma cell line
R;Myers, J.C.; Loidl, H.R.; Stolle, C.A.; Seyer, J.M.
J. Biol. Chem. 260, 5533-5541, 1985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ;Molecule type: DNA;Residues: 1-32 <GRE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Accession: S43643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Accession: A31427
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Si
Matches 143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
J. Biol. Chem. 252, 639-643, 1977
A, Tille: The Covalent structure of cartilage collagen. Evidence for sequence heterogenes, A, Reference number: A9210, WID:7703864; PMID:833147
A, Accession: A92210
A, Midcession: A92210
A, Midcession: A92210
A, Mose and an incor, probably nonallelic, alpha 1(II) component has 143-Ala, 164-Leu, and pode R, Scartiage
A, Rocession: A9210
A, Mose and annor, probably nonallelic, alpha 1(II) component has 143-Ala, 164-Leu, and pode R, Scartiage
A, Mose annor, probably nonallelic, alpha 1(II) component has 143-Ala, 164-Leu, and pode R, Scartiage
A, Mose annor, probably nonallelic, alpha 1(II) component has 143-Ala, 164-Leu, and pode R, Scartiage and A, Mose and A, Accession: S03940
A, Molecule type: procein
A, Reference number: 603940
A, Molecule type: procein
A, Residues: 139-417
A, Tille: Homologous eregions of collagen alphal (I) and alphal (II) chains: apparent clust A, Residues: 184-427
A, Tille: Homologous eregions of collagen alphal (I) and alphal (II) chains: apparent clust A, Residues: 184-427
A, Mose and A, A, Casession: A90189
A, Molecule type: procein
A, Residues: 184-242
A, Residues: A93-673
A, Residues: A33-73-1415
A, Residues: A33-73-1415
A, Residues: A33-73-1415
A, Resid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   end
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   does
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                367 GEAGL PGAKGLTGRPGDAGPQGKVGPSGAPGEDGRPGPPGPQGARGQPGVHGFPGPKGAN 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GEPGKAGERGVPGPPGAVGPACKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  collagen alpha 1(III) chain - chicken (fragment)
C;Species: Gallus gallus (chicken)
C;Species: Gallus gallus (chicken)
C;Date: 13-Sep-1996 #sequence_revision 13-Sep-1996 #text_change 13-Aug-1999
C;Accession: I50694
R;Nah, H.D., Niu, Z.; Adams, S.L.
R;Nah, H.D., Niu, Z.; Adams, S.L.
A;Dicl. Chem. 269, 16443-16448, 1994
A;Title: An alternative transcript of the chick type III collagen gene that
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ..
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 673;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ouery Match 68.8%; Score 815; DB 1; Length 67
Best Local Similarity 78.9%; Pred. No. 1.1e-38;
Matches 146; Conservative 4; Mismatches 35; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GPPGE 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPPGE 491
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181
```

Bern

g

ò

g ò a ሯ

```
A;Molecule type: mRNA
A;Residuss: 1-170 <700-
A;Residuss: L-170 <700-
A;Cross-references: EMBL:X07240; NID:g30060; PIDN:CAA30229.1; PID:g30061
A;Note: the authors translated the codon CAG for residue 154 as His
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match 66.4%; Score 786; DB 1; Length 1496; Best Local Similarity 67.3%; Pred. No. 8.3e-37; Matches 140; Conservative 15; Mismatches 53; Indels (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Reference number: S04642; MUID:89350838; PMID:2764886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPPGEGGKPGDQGVPGGPGAVGPLGPRG 708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Accession: S04642
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Accession: PE0011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A/Description: structural component of extracellular fibrous polywer associated with cell A/Note: may play a role in controlling the lateral growth of collagen I fibrils
C/SUperfamily: collagen alpha I(I) chain, fibrilar collagen carboxyl-terminal homology;
C/SUperfamily: collagen alpha I(I) chain, fibrilar collagen carboxyl-terminal homology;
C/SEYWORDS: coiled coil; extracellular matrix; glycoprotein; hydroxylysine; hydroxyprolif F;1-26/Domain: signal sequence #status predicted <SIG>
F;27-195/Domain: onlagen alpha 2(V) chain #status predicted <WAT>
F;27-195/Domain: won Willebrand factor type C repeat homology <WC>
F;09-196/Region: nonhelical
F;09-186/Region: nonhelical
F;109-186/Region: nonhelical
F;109-186/Region: cell attachment (R-G-D) motif
F;109-125/Region: cell attachment (R-G-D) motif
F;109-1059/Region: cell attachment (R-G-D) motif
F;109-1059/Region: cell attachment (R-G-D) motif
F;109-1059/Region: cell attachment (R-G-D) motif
F;109-1056/Region: cell attachment (R-G-D) motif
F;109-1059/Region: cell attachment (R-G-D) motif
F;109-1056/Region: cell attachment (R-G-D) motif
F;109-1056/Regio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: mRNA
A; Residues: 1003-1034 -RES>
A; Cross-references: GB: MILL135; NID:g179693; PIDN: AAAS1857.1; PID:g179694
A; Note: part of this sequence were determined by protein sequencing
R; Myers, J.C.; Loidl, H.R.; Seyer, J.M.; Dion, A.S.
Biol. Chem. 260, 11216-11222, 1985
A; Title: Complete primary structure of the human alpha-2 type V procollagen COOH-termina
A; Reference number: A25374; MUID:85289337; PMID:2411731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rifspouras, P.; Schwartz, R.C.; Liddell, A.C.; Salkeld, C.S.; Weil, D.; Ramirez, F. Genomics 3, 275-277, 1988
A;Title: Genetic distance of two fibrillar collagen loci, COL3A1 and COL5A2, located on A;Reference number: A30017; WUID:89138450; PMID:3224983
A;Accession: A30017
A;Accession: A30017
A;Accession: A30017
A;Residues: LA49-1463, E.,1465-1495, A, <TSI>A;Coss-references: GB:J03051; NID:g179695; PIDN:AAA51858.1; PID:g179696
A;Coss-references: GB:J03051; NID:g179695; PIDN:AAA51858.1; PID:g179696
C;Comment: Prollines and lysines at the third position of the tripeptide repeating unit are 5-hydroxylated and subsequently O-glycosylated.
C;Comment: The amino-terminal propeptide domain appears not to be completely cleaved.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Cross references: GDB:119064; OMIM:120190
A;Map position: 2q31-2q31
A;Map position: 2q31-2q31
A;Introns: 33/1; 812/3; 830/3; 838/3; 884/3; 902/3; 974/3; 1046/3; 1064/3; 1448/3
C;Complex: type V collagen may be a homotrimer of alpha 1(V) chains (see PIR:CGHUIV), a alpha 2(V) chain and one alpha 3(V) chain, initially linked by disulfide bonds among the ength, is formed with desmosine cross-links made from lysine and allysine residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   on the long arm
          2 type V collagen chain.
                                                                             A/Accession: 155239
A/Status: translated from GB/EMBL/DDBJ
A/Status: translated from GB/EMBL/DDBJ
A/Status: translated from GB/EMBL/DDBJ
A/Status: translated from GB/EMBL/DDBJ
A/Status: 1002-1226 <RE2>
A/Cross-references: GB:M10956; NID:g180427; PIDN:AAA52007.1; PID:g180428
A/Note: part of this sequence were determined by protein sequencing R:Emanuel, S.S.; Cannizzaro, L.A.; Seyer, J.M.; Myers, J.C.
Proc. Natl. Acad. Sci. U.S.A. 82, 3385-3389, 1985
A/Title: Human alpha 1(III) and alpha 2(V) procollagen genes are located cA; Accession: 159025; MUD:85216505; PMID:3858826
A/Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Molecule type: mRNA
A;Residuss: 1227-1417, T',1419-1437,'S',1439-1496 <MYE>
A;Cross-references: GE:M11718; NID:g180912; PIDN:AAAS2058.1; PID:g180913
A;Experimental source: normal fibroblasts
     human alpha 3
PMID:2985598
Title: Partial covalent structure of the Reference number: 155239; MUID:85182703;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Gene: GDB: COL5A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C; Function:
```

```
#St:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            collagen alpha 1(III) chain precursor - human

N;Alternate names: procollagen alpha 1(III) chain

C;Spates: 24-Aprocospiens (man)

C;Dates: 24-Aprocospiens (man)

C;Accession: 805272; 804642; PE0011; 801726; 804887; A90399; A94562; I51868; 859511; A904

Submitted to the EMBL Data Library, Pebruary 1989

A;Reference number: 805272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A, Status: preliminary
A, Status: preliminary
A, Modecule type: mRNA
A, Residues: 1-1240, V, 1242-1466 <PRC>
A, Cross-references: EMBL:X14420; NID:G30057; PIDN:CAA32583.1; PID:G30058
B, Ala-Kokko, L.; Kontusaarari, S.; Baldwin, C.T.; Kuivaniemi, H.; Prockop, D.J.
Biochem. J. 260, 509-516, 1989
A, Title: Structure of cDNA clones coding for the entire prepro-alphal(III) chain of humar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: DNA
A; Residues: 1-176 < BEN>
A; Residues: 1-176 < BEN>
A; Cross-references: G: W126399; NID: g180813; PIDN: AAA52040.1; PID: g180814
R; Toman, P.D.; Ricca, G.A.; de Crombrugghe, B.
Nucleic Acids Res. 16, 7201, 1988
A; Title: Nucleotide sequence of a CDNA coding for the amino-terminal region of human preg
A; Reference number: S01726; MUID: 88303360; PMID: 3405773
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \stackrel{\smile}{\sim}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A,Molecule type: mRNA
A,Residues: 1-1196 <ALA>
A,Residues: 1-1196 <ALA>
A,Residues: 1-1196 <ALA>
A,Residues: 1-1196 <ALA>
A,Notes references: BRBL:X14420; NID:g30057; PIDN:CAA32583.1; PID:g30058
A,Note: the complete sequence is not shown
R,Benson-Chanda, V.; Su, M.W.; Weil, D.; Chu, M.L.; Ramirez, F.
Gene 78, 255-265, 1989
A,Title: Cloning and analysis of the 5' portion of the human type-III procollagen gene
A,Reference number: PE0011; MUID:89378752; PMID:2777083
F;201/Modified site: allysine (Lys) #status predicted
F;290,293,296,608,614,1004,1007,1013,1028,1034/Modified site: 4-hydroxyproline (Pro): F;299,1139/Modified site: 5-hydroxylysine (Lys) #status predicted
F;299,1139/Modified site: carbohydrate (Lys) #status sprenimental
F;1025/Modified site: 5-hydroxylysine (Lys) #status experimental
F;1259,1139/Binding site: carbohydrate (Asn) (covalent) #status predicted
F;1259,1251/Gleavage site: Glu-Asp (procollagen C-endopeptidase) #status predicted
F;1259,1295,12197/Binding site: carbohydrate (Asn) (covalent) #status predicted
F;1293,1295,12197/Binding site: shonds: interchain #status predicted
F;1333-1494,1402-1447/Disulfide bonds: #status predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 621 GDPGKPGEAGNPGVPGQRGAPGKDGKVGPYGPPGPPGLRGERGERGEGPPGPPGPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
```

Fri

```
A,Map position: 2q31-2q31
A;Introns: 27/1; 94/3; 111/3; 149/3; 176/3; 554/3; 587/3; 1175/3; 1275/1; 1337/3; 1418/3
A;Introns: 27/1; 94/3; 111/3; 149/3; 176/3; 554/3; 587/3; 1175/3; 1275/1; 1337/3; 1418/3
A;Nore: the list of introns is incomplete; defects in this gene can result in Ehlers-Danl C;Complex: type III collagen is a homotrimer of monomers initially linked by disulfide bc or of their length, is formed with desmosine cross-links made from lysine and allysine re
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Description: structural component of extracellular fibrous polymer that maintains integ C; Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxyl-terminal homology; C; Keywords: coiled coil; Ehlers-Danlos syndrome; extracellular matrix; glycoprotein; hydi
                                                              A; Molecule type: mENA
A; Residues: 861-1015 < COL>
A; Residues: 861-1015 < COL>
A; Cross-references: 08:05617; GB: M55603; GB: M59227; NID: g180878; PIDN: AAB59383.1; PID: g1
A; Note: a mutant sequence with 942-977 spliced out from a patient with Ehlers-Danlos sync
R; Mankoo, B.S.; Dalgleish, R.
Nucleic Acids Res. 16, 2337, 1988
A; Title: Human pro alpha1(III) collagen: cDNA sequence for the 3' end.
A; Reference number: 802119; MUID: 88189827; PMID: 3357782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Molecule type: protein and seq. 'PS',987,'QN',990-1096,'P',1098-1152,'AT',1155,'S',1157-:
;Expesidues 965-979, A',981-984,'PS',987,'QN',990-1096,'P',1098-1152,'AT',1155,'S',1157-:
;Experimental source: liver
;Loidl, H.R.; Brinker, J.M.; May, M.; Fihlajaniemi, T.; Morrow, S.; Rosenbloom, J.; Mye:
;Loidl, H.R.; Brinker, J.M.; 9383-9384, 1984
;Title: Molecular cloning and carboxyl-propeptide analysis of human type III procollages
;Reference number: A93551; MJID:85087944; PMID:6096827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Status: translated from GB/EMBL/DDBJ

4;Molecule type: mRNA

4;Rosicuses: 1161-1200 <ali>MLS-

4;Cross-references: GB:M13146; NID:g180415; PIDN:AAAS2003.1; PID:g180416

5;Emanuel, B.S.; Cannizzaro, L.A.; Seyer, J.M.; Myers, J.C.

5;Emanuel, B.S.; Cannizzaro, L.A.; Sayer, J.M.; Myers, J.C.

7;Title: Human alpha 1(III) and alpha 2(V) procollagen genes are located on the long arm 1;Reference number: I59025; MUID:85216505; PMID:3858826

1;Reference number: IS9025; MUID:85216505; PMID:3858826

1;Reference number: IS9025; MUID:85216505; PMID:3858826
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A.Note: the authors translated the codon TTC for residue 1057 as Tyr; the codons given for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        , Comment: Prolines and lysines at the third position of the tripeptide repeating unit (6 3-hydroxylated. About 15% of the lysines are 5-hydroxylated and some are subsequently 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Molecule type: mRNA, P.,1157-1466 <LOI> NID:929584; PIDN:CAA25821.1 First. P., 1157-1466 <LOI> NID:929584; PIDN:CAA25821.1 P., 126.2 P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        from typ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           pro-alphal(III) collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Molecule type: DNA
A;Residues: 1176-1240, VV, 1242-1356, PV, 1358-1466 <CHU>
A;Cross-references: GB:M10615; GB:M10793; GB:M10794; GB:M10795; GB:M10796; GB:M10797;
A;Experimental source: liver
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /Status: translation not shown
//Status: translation not shown
//Modecule type: mRNA
//Stasidues: 950-1018, Y',1020-1183,'S',1185-1466 <MAN>
//Cross-references: BMBL:X06700; NID:g30053; PIDN:CAA29886.1; PID:g30054
//Seyer, J.M.; Kang, A.H.
//Seyer, J.M.; Kang, A.H.
//Title: Covalent structure of collagen: amino acid sequence of alphal (III)-CB9:
//Reference number: A90446; MUID:81208139; PMID:7016180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Molecule type: mRNA

;Residues: 1165-1196 <ERA>,

;CRSS-references: GB: M11134; NID: 9180417; PIDN: AAA52004.1; PID: 9180418

;Chu, M.L.; Weil, D.; de Wet, W.; Bernard, M.; Sippola, M.; Ramirez, F.

- Biol. Chem. 260, 4357-4363, 1985

;7ttle: Isolation of cDNA and genomic clones encoding human pro-alphal(I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GDB:118729; OMIM:120180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Status: .translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Gene: GDB: COL3A1
A; Cross-references:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Accession: A92516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Accession: A93551
            Ridaneczko, R.A.; Ramirez, F.
Nuclect Acids Ress. 17, 6742, 1989
Aritle: Nucleotide and amino acid sequences of the entire human alpha-1 (III) collagen.
Aritle: Nucleotide and amino acid sequences of the entire human alpha-1 (III) collagen.
Aritle: Nucleotide and amino acid sequences of the entire human alpha-1 (III) collagen.
Aritle: Oxforder and amino acid sequences of the entire human alpha-1 (III) collagen.
Aritle: Cordance type: mRNA
Arcessions: EMB:XL5332, NUD:292545; PIDM:CAA3387.1; PDD:9930045
Aritle: Cordance: EMB:XL5332, NUD:292545; PIDM:CAA3387.1; PDD:9930045
Aritle: Cordance: EMB:XL5332, NUD:292645; PIDM:CAA3387.1; PDD:9930045
Aritle: Cordance try 16, 1158-1164, 1977
Aritle: Cordance or Aritle: Cordance of collagen: amino acid sequence of cyanogen bromide peptide
Aritle: Cordance try 16, 1158-1164, 1977
Aritle: Cordance or Aritle: Aritle: Aritle: Aritle: Aritle: Aritle: Cordance or Aritle: Ari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   규
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COL3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        of five consecutive CNBr pe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      £
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           causes exon skipping an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H.H.M.; Char
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Molecule type: protein
Residues: 399-675, N', 677-727 <SEY3>
Residues: 399-675, N', 677-727 <SEY3>
Les Bayerimental source: liver
Les B.; Vitale, E.; Superti-Furga, A.; Steinmann, B.; Ramirez, F.
Biol. Chem. 266, 2555-2559, 1991
Title: G to T transversion at position +5 of a splice donor site causes skipping of the ference number: 155349; MUID:91161621; PMID:1672129
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Reference number: 151868; MUID:93304430; PMID:8317500
A;Reference number: 151868; MUID:93304430; PMID:8317500
A;Reference number: 151688
A;Status: preliminary; translated from GB/EMBL/DD30
A;Status: preliminary; translated from GB/EMBL/DD30
A;Status: preliminary; translated from GB/EMBL/DD30
A;Reference: 166-194 eMIL>
A;Reference: 136-194 eMIL>
A;Reference: 1311, 939-943, 1395; Cole, W.G.; Bateman, J.F.
B;Chiodo, A.A.; Sillence, D.C. Cole, W.G.; Bateman, J.F.
A;Reference: 259311, MUID:96067614; PMID:7487994
A;Reference: 259311, MUID:96067614; PMID:7487994
A;Reference: 259311, MUID:96067614; PMID:7487994
A;Reference: 259413, AH.
B;Reference: GB:S79877; NID:91195576; PIDN:AAB35615.1; PID:91195577
B;Reference: A30443, AH.
B;Reference: A30444; MUID:79000343; PMID:687591
A;Residues: 399-675.W.677-727 <8273>
A;Residues: 259-67-W.677-727 <8273>
A;Residues: 259-67-W.677-727 <8273>
A;Residues: 259-67-W.677-727 <8273>
A;Rite: G to T translated from GB/EMBL/DD3J
A;Residues: 257-605 & Libez
A;Reference number: 155349; MUID:9116621; PMID:1672129
A;Reterence number: 155349; MUID:9116621; PMID:6246925
A;Reterence number: 155349; MUID:91990282; PMID:6246925
A;Reterence number: A30438 MUID:91990282; PMID:6246925
A;Reterence number: A30438 MUID:91099133; PMID:2146268
A;Reterence number: A30438 MUID:91099133; PMID:2146268
A;Reterence number: A30439 MUID:91009133; PMID:2146268
A;Reterence number: A30303; MUID:91009133; PMID:2146268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (III)-CBS from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the
Janeczko, R.A.; Ramirez, F.
Acleic Acids Res. 17, 6742, 1989
Titlels Nucleotide and amino acid sequences of the entire human alpha-1 (III)
Reference number: S04887; MUID:89386015; PMID:2780304
Accession: S04887
```

ቯ

g

```
F;1-23/Domain: signal sequence #status predicted <SIG>
F;2-153/Domain: signal sequence #status predicted <PRO>
F;24-153/Domain: amino-terminal propeptide #status predicted <PRO>
F;154-1221/Product: collagen alpha 1(III) chain #status predicted <MAT>
F;154-1221/Product: collagen alpha 1(III) chain #status predicted <MAT>
F;154-1221/Product: collagen alpha 1(III) chain #status predicted <MAT>
F;154-1261/Pregion: amino-terminal nonhelical telopeptide
F;163-1261/Region: carboxyl-terminal nonhelical telopeptide
F;1031-1033/Region: carboxyl-terminal nonhelical telopeptide
F;1137-1221/Region: carboxyl-terminal propeptide #status predicted
F;1238-1466/Domain: fibrillar collagen carboxyl-terminal homology <FCC>
F;24/Modified site: pyrrolidone carboxylic acid (Gln) (in mature form) #status predicted
F;155-154/Cleavage site: pyrrolidone carboxylic acid (Gln) (in mature form) #status predicted
F;161,1212/Modified site: allysine (Lys) #status predicted
F;161,1212/Modified site: allysine (Lys) #status experimental
F;263,284,860,977,1106/Modified site: 5-hydroxylysine (Lys) #status experimental
F;584,1094/Modified site: 5-hydroxylysine (Lys) #status experimental
F;948-949/Cleavage site: Gly-Ile (Collagenase) #status experimental
F;106/Binding site: carbohydrate (Lys) (covalent) #status experimental
```

ö 468 GSPGEPGANGLPGAAGERGAPGFRGPAGPNGIPGEKGPAGERGAPGERGAPGEPGRD 527 61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPRGQAGVMGFPGPKGAA 120 121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180 588 GAPGKONGERGGPGGPGPPGKNGETGPQGPPGPTGPGCDTGPPGPDGLPGTG 647 1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP 60 0; Gaps Query Match 65.5%; Score 776; DB 1; Length 1466; Best Local Similarity 66.3%; Pred. No. 2.9e-36; Matches 138; Conservative 12; Mismatches 58; Indels ( d Db ò d ð ò

à

Search completed: September 24, 2004, 11:11:45 Job time : 9.04914 secs

```
18, Appl 18, Appl 19, Appl 19, Appl 10, Appl 11, Appl 11,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 18, Appl
Sequence 18, Appl
                                                                                                                 September 24, 2004, 11:06:56; Search time 8.60425 Seconds (without alignments) 1254.011 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                              US-10-658-989A-1
1184
I GPPGERGPTGLPGERGG......GEQGVPGDLGAPGPSGPAGG 209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 1
Sequence 5
Sequence 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence Sequence Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
Sequence
Sequence
Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1: /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
2: /cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
3: /cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
4: /cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
5: /cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
6: /cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-08-963-825-18

US-09-500-811-18

US-09-570-671-18

US-09-5848-608-18

US-09-585-887-9

US-09-289-578-9

US-09-211-3478-9

US-09-219-849-48

US-09-219-849-49

US-09-219-849-49

US-09-219-849-49

US-09-219-849-49

US-08-911-820-3

US-08-911-820-3

US-08-96-10

US-08-96-10

US-08-91-820-3

US-08-91-820-3

US-08-91-820-3

US-08-91-820-3

US-08-91-820-4

US-09-500-811-20

US-09-548-608-20

US-09-548-608-20

US-08-91-820-4

US-08-91-820-811-21

US-08-91-820-811-21

US-08-91-821-12
                                                                                                                                                                                                                                                                                                                                                                                    Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                           389414 seqs, 51625971 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                             - protein search, using sw model
                                                                                                                                                                                                                                                                               BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Issued_Patents_AA:*
                                                                                                                                                                                                                                                                                                                                                                                                                          length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query
Match Length DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Title:
Perfect score:
Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sed
sed
                                                                                                                                                                                                                                                                               Scoring table:
                                                                                 OM protein
                                                                                                                                                                                                                                                                                                                                                                                                                          Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Database :
                                                                                                                       Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Result
```

```
WESULI 1

WESULI 1

WESULI 1

Sequence 18, Application US/08963825

Sequence 18, Application US/08963825

Sequence 18, Application US/08963825

Sequence 18, Application US/08963825

GENERAL INFORMATION:

APPLICANT: Bonde, Martin

TITLE OF INVENTION: in Body Fluids, A Test Kit and Means for Carrying Out the

TITLE OF INVENTION: in Method and Use of the Method to Diagnose the Presence of

TITLE OF INVENTION: Disorders Associated with the Metabolism of

NUMBER OF SEQUENCES: 2

ADDRESSEE: Darby PC

STREET: 805 Third Avenue

CITY: New York

STATE: New York

COUNTRY: USA
                                                                                                                                                              65,
65,
                                                                                                                                                                                                                                                                                                          Sequence Sequence Sequence
educance seducance seducan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-585-887-10

US-08-918-850-10

US-08-918-851-19

US-08-951-825-19

US-09-5700-811-19

US-09-570-573-19

US-09-570-573-19

US-09-570-573-19

US-09-570-573-19

US-08-475-411A-65

US-08-478-029A-65

US-08-642-255-52

US-08-642-255-53

US-08-642-255-53
                                                                                                                                                                                                                                                                                                                                                                                                                 ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEFAX: 212-753-6237
TELEX: 236687
INFORMATION FOR SEQ ID NO: 18:
SEQUENCE CHARACTERISTICS:
LENGTH: 1341 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE: amino acid
TYPE: amino acid
TOPOLOGY: 1:-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CLONE: COLLAGEN ALPHA 1
US-08-963-825-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM: Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MOLECULE TYPE: protein ORIGINAL SOURCE:
    IMMEDIATE SOURCE:
CLONE: COLLAGE
    22666666666666444444
86012646966866444444
```

N

Fri Sep 24 11:45:38 2004

```
97.0%; Score 1149; DB 4; Length 1341;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STREET: 805 Thir
CITY: New York
STATE: New York
COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE
                                                                                                                                                                                                                                                                                                                                                                                                           US-09-570-573-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-570-573-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                 g
                                                                                                                                                                          ద
                                                                                                                                                                                                                                                                                              à
                                                                                                                                            ઠ
                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 18, Application US/09500811

Patent No. 6323314

GENERAL INFORMATION:
APPLICANT: Ovist, Per
APPLICANT: Bonde, Martin
ITILE OF INVENTION: A Method for Assaying Collagen Fragments
TITLE OF INVENTION: in Body Fluids, A Test Kit and Means for Carrying Out the
TITLE OF INVENTION: Method and use of the Method to Diagnose the Presence of
TITLE OF INVENTION: Disorders Associated with the Metabolism of
NUMBER OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
ADDRESSEE: Darby & Darby PC
                                              ij
                                                                                                                                                                                                                                                                            513
                                                                                                           49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                               ---GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                       454 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                              Gaps
  97.0%; Score 1149; DB 3; Length 1341; 93.6%; Pred. No. 2e-72; ive 0; Mismatches 2; Indels 12;
                                                                                                                                                                                                                                                                                                                                        514 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/500,811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/187,319
FILING DATE:
ATTORNEY/AGENT:
ATTORNEY/AGENT:
RATIONNEY/AGENT:
REFERENCE/DOCKET NUMBER: 29,714
REFERENCE/DOCKET NUMBER: 4305/08701
TELECPHONICATION INPORMATION:
TELECPHONE: 212-57-7700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COUNTY.

ZIP: 10022
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
TYPE: Floppy disk
TYPE: Floppy disk
TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       E: Darby & Darby PC
805 Third Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IMMEDIATE SOURCE:
CLONE: COLLAGEN ALPHA 1 (I)
38-09-500-811-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEX: 236687
INFORMATION FOR SEQ ID NO: 18:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LENGTH: 1341 amino acids
TYPE: amino acid
TOPOLOGY: linear
                                      Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM: Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE: protein ORIGINAL SOURCE:
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CITY: New York
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 2
US-09-500-811-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEFAX:
TELEX: 2:
                                                                                                                                                                                                                                                                                                            169
                                                                                                           d
                                                                                                                                                      ò
                                                                                                                                                                                        g
                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                               q
                                                                                                                                                                                                                                                                                                          \delta
```

```
A Method for Assaying Collagen Fragments in Body Fluids, A Test Kit and Means for Carrying Out the Method and Use of the Method to Diagnose the Presence of Disorders Associated with the Metabolism of
                                                               ï
                                                                                                                                                                  334 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 393
                                                                                                                                                                                                                                 49 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                               394 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGODGRPGPPGPPGARGQA 453
                                                                                                                                                                                                                                                                                                                                                                                 109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGBAGERGEQGPA 168
                                                                                                                     ----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                               Gaps
                                                            12;
97.0%; Score 1149; DB 4; Length 1341; 93.6%; Pred. No. 2e-72; 1. Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                         169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 514 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           4305/08701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 18, Application US/09570573
Patent No. 6342361
GENERAL INFORMATION:
APPLICANT: Qvist, Per
APPLICANT: Bonde, Martin
ITILE OF INVENTION: A Method for As
TITLE OF INVENTION: In Body Fluids,
TITLE OF INVENTION: Disorders Assoc
NUMBER OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING APPLICATION:
PRIOR APPLICATION:
APPLICATION NUMBER: 08/187,319
FILING DATE:
ATTORNEY/ABENT INFORMATION:
NAME: GOGOTIE, Adda C
REGISTRATION NUMBER: 29,714
REFERENCE/DOCKET NUMBER: 4305/087
TELEFRANCATION INFORMATION:
TELEFRANCATION FOR SEQ ID NO: 18:
SEQUENCE CHARACTERISTICS:
LENGTH: 1141 amino acids
TYPE: amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA: APPLICATION NUMBER: US/09/570,573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      E: Darby & Darby PC
805 Third Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IMMEDIATE SOURCE:
CLONE: COLLAGEN ALPHA 1 (I)
Query Match
Best Local Similarity 93.6;
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MOLECULE TYPE: protein ORIGINAL SOURCE:
```

us-10-658-989a-1.rai

g à 음 ò

ò

```
Sequence 9, Application US/09585887

Sequence 9, Application US/09585887

Sequence 9, Application US/09585887

Sequence 9, Application US/09585887

GENERAL INFORMATION:

APPLICANT: Chang, Robert

APPLICANT: Chisholm, Ronald A.

APPLICANT: Chisholm, George

TITLE OF INVENTION: PULL-LENGTH TRIPLE HELICAL COLLAGEN IN RECOMBINANT;

TITLE OF INVENTION: PULL-LENGTH TRIPLE HELICAL COLLAGEN IN RECOMBINANT;

TITLE OF INVENTION: PULL-LENGTH TRIPLE HELICAL COLLAGEN IN RECOMBINANT;

TITLE OF INVENTION: US/09/585,887

CURRENT APPLICATION NUMBER: 09/289,578

PRIOR PILING DATE: 1999-04-09

PRIOR APPLICATION NUMBER: 60/084,828

NUMBER: OF SEQ ID NOS: 11

SOFTWARE: PATENTIN VET. 2.0

SEQ ID NO 9

LENGTH: 1461
7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          109 GVMGFPGFKGAAGEPGKAGERGVPGFPGAVGFAGKDGEAGAQGPPGFPAGFAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           575 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPA 634
                                                                                    393
                                                                                                                                                                                                                      168
                                          48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    455 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               394 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGFAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                       454 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGEKGEQGPA
                                                                                                                                                                                                                    109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 GPP-------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                            -----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                               49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
Gaps
12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 1461;
Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          dsperocipedpagpagpagkperocypedicapepsgarg 674
                                                                                                                                                                                                                                                                                                              169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                               514 GSPGFÇGLPGPAGPPGBAGKPGEQGVPGDLGAPGPSGARG
2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 1149; DB 4;
Pred. No. 2.2e-72;
  0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 9, Application US/09289578; Patent No. 6428978; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity 93.6%;
Matches 206; Conservative
    206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CRGANISM: Homo sapiens US-09-585-887-9
                                               1 GPP----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-289-578-9
                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 5
US-09-585-887-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              635
    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             슝
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                 δ
                                                                                                                                                                     g
                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 18, Application US/09548608

Patent No. 635542

GENERAL INFORMATION:
APPLICANT: Qvist, Per
APPLICANT: Bonde, Martin
TITLE OF INVENTION: in Body Fluids, A Test Kit and Means for Carrying Out the
TITLE OF INVENTION: in Body Fluids, A Test Kit and Means for Carrying Out the
TITLE OF INVENTION: Disorders Associated with the Metabolism of
NUMBER OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
ADDRESSEE: Darby & Darby PC
                                                                                                                                                                                                                                              109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                          334 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA. 393
                                                                                                                                                         49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                      394 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 453
                                                                    1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPXGPAGERGSPGPA
                            Gaps
                            12;
                         2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ADDRESSEE: Darby & Darby PC
STREET: 805 Third Avenue
CITY: New York
STATE: New York
COUNTRY: USA
ZIP: 10022
COMPUTER READABLE FORM:
MEDIUM TYPE: FALOPY disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/NS-DOS
SOCTWARE: PATENT Release #1.0, Version #1.25
CURRENT APPLICATION DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
FILING DATE:
                                                                                                                                                                                                                                                                                                                                        169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                             514 GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGARG 553
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1149; DB
Pred. No. 2e-72;
  Pred. No. 2e-72;
                         0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/187,319
FILING DATE:
FILING DATE:
ATTORNEY/AGENT INFORWATION:
NAME: 6090x15, Adda C.
REGISTRATION NUMBER: 29,714
REFERENCE/DOCKET NUMBER: 4305/08701
TELECOMMUNICATION:
TELEFHONE: 212-527-7700
TELEFAX: 212-527-770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid
TOPOLOGY: 1:18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEX: 236687
INFORMATION FOR SEQ ID NO: 18:
SEQUENCE CHARACTERISTICS:
LENGTH: 1341 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     97.0%;
  93.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IMMEDIATE SOURCE:
CLONE: COLLAGEN ALPHA 1
                         Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MOLECULE TYPE: protein ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
    Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 4
US-09-548-608-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-548-608-18
```

```
ö
                                                                                                                  578 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 637
                                                       109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    429 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               309 GPWGEAGSAGPPGPPGLRGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 94.6%; Score 1120; DB 3; Length 1057; Best Local Similarity 96.2%; Pred. No. 1.7e-70; Matches 200; Conservative 0; Mismatches 8; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                RESULT 8

US-08-931-820-1

| Sequence 1, Application US/08931820
| Patent No. 6010863
| GENERAL INFORMATION:
| APPLICANT:
| APPLICANT:
| APPLICANT:
| APPLICANT:
| APPLICANT:
| COMPUTER: FORM: | ASSAY for Collagen degradation NUMBER OF SEQUENCES: 4
| COMPUTER: FORM: | ASSAY for COLLAGENCES: 4
| COMPUTER: FORM: | FORM: | APPLICANTION SYSTEM: PC-DCS/MS-DCS SOFTWARE: PatentIn PC-DCS/MS-DCS SOFTWARE: PatentIn PRE-BEASTER STORE: | SOFTWARE: PATENTION NUMBER: US/08/931,820
| FILING DATE: | CLASSIFICATION: DATA: | APPLICATION: DATA: | APPLICATION: DATA: | APPLICATION: POR SEQ ID NO: 1: | INFORMATION: POR SEQ ID NO: 1: | INFORMA
                                                                                                                                                                                                              169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                 638 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 GPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPPGEAGKPGEQGVPGDLGAPGPSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 48, Application US/09219849; Patent No. 6150081; GENERAL INFORMATION: APPLICANT: VAN HEENDE, GEORGE V. APPLICANT: VAN RIJN, ALEXIS C. APPLICANT: BOUWSTEA, JAN B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM: Homo sapiens
; TISSUE TYPE: Collagen type I
US-08-931-820-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 1057 amino acids
TYPE: amino acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE: protein
HYPOTHETICAL: NO
ANTI-SENSE: NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 9
US-09-219-849-48
                                                                                                                      셤
                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ψ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-331-347C-21
Sequence 21, Application US/09331347C
Sequence 21, Application US/09331347C
Sequence 21, Application US/09331347C
SEGUENT NOTICE OF INFORMATION:
APPLICANT: Meristem Therapeutics, S.A.
TITLE OF INVENTION: Recombinant Collagens and Derived Proteins Produced by Plants, N. TITLE OF INVENTION: Obtaining Such and Their Uses
FILE REFERENCE: 1149-3
FURENT APPLICATION NUMBER: US/09/331,347C
CURRENT FILING DATE: 1999-08-17
NUMBER OF SEQ ID NOS: 22
SOFTWARE: Patentin version 3.1
APPLICANT: Olsen, David R
APPLICANT: Chang, Robert
APPLICANT: Chang, Robert
APPLICANT: Chang, Robert
APPLICANT: Hitzenn, Ronald A.
APPLICANT: Hitzenn, Ronald A.
APPLICANT: Chisholm, George
TITLE OF INVENTION: NOVEL METHODS FOR THE PRODUCTION OF GELATIN AND
TITLE OF INVENTION: CELLS.
TITLE OF INVENTION: CELLS.
FILE REFERENCE: 225002030400
CURRENT APPLICATION NUMBER: US/09/289,578
CURRENT FILING DATE: 1999-04-10
PRIOR PILING DATE: 1999-04-10
PRIOR PILING DATE: 1998-05-08
NUMBER OF SEQ ID NOS: 11
SOFTWARE: PATENTIN VET: 2.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            458 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         49 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        518 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   455 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 GPP------GEPGPIGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels 12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 97.0%; Score 1149; DB 4; Length 1461; Best Local Similarity 93.6%; Pred. No. 2.2e-72; Matches 206; Conservative 0; Mismatches 2; Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match

97.0%; Score 1149; DB 4; Length 1464;
Best Local Similarity 93.6%; Pred. No. 2.2e-72;
Matches 206; Conservative 0; Mismatches 2; Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   535 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: PRT
ORGANISM: Homo sapiens
US-09-289-578-9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: PRT
ORGANISM: Homo sapiens
US-09-331-347C-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQ ID NO 21
LENGTH: 1464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1461
```

g à qq δ P 8

g ò

ò

```
US-09-219-849-49
    Query Match
Best Local Si
Matches 199,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                      엄
                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                            ठे
                                                                                                                                                                                         ઠે
                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 50, Application US/09219849
; Sequence 50, Application US/09219849
; Patent No. 6150081
; GENRRAL INFORMATION
; APPLICANT: VAN HEERDE GEORGE V.
; APPLICANT: VAN HEERDE GEORGE V.
; APPLICANT: BOUWSTRA, JAN B.
; APPLICANT: BOUNDSTRA, JAN B.
; APPLICANT: BOUNDSTRA, JAN B.
; APPLICANT: MODBROSK, ANDREAS
; APPLICANT: WIND, RICHELE D.
; APPLICANT: WIND, RICHELE D.
; APPLICANT: WIND SHOREH, TANJA J.
; APPLICANT: WIND SHOREH, TANJA J.
; TITLE OF INVENTION: SUITABLE FOR PHOTOGRAPHIC APPLICATION AND ALSO THE FILLE REFERENCE: 2728-2
; TITLE OF INVENTION: PREPARATION THEREOF
; TITLE OF INVENTION: PREPARATION THEREOF
; TITLE OF INVENTION: PREPARATION THEREOF
; TITLE OF INVENTION: 1998-12-23
; CURRENT APPLICATION NUMBER: US/09/219,849
; CURRENT APPLICATION HOS: 50
; SOFTWARE: PATENTIN Ver. 2.1
; SEQ ID NO 50
; LERGTH: 595
APPLICANT: DE WOLF, FREDERIK A.
APPLICANT: MCOBROEK, ANDREAS
APPLICANT: WORDSOEK, ANDREAS
APPLICANT: WERTEN, MARC W. T.
APPLICANT: WIND, RICHELE D.
APPLICANT: WIND, RICHELE D.
TITLE OF INVENTION: SILVER HALIDE EMULSIONS WITH RECOMBINANT COLLAGEN
TITLE OF INVENTION: SULTABLE FOR PHOTOGRAPHIC APPLICATION AND ALSO THE
TITLE OF INVENTION: PREPARATION THEREOF
FILE REPERBENCE: 2728-2
CURRENT APPLICATION NUMBER: US/09/219,849
CURRENT APPLICATION NUMBER: US/09/219,849
CURRENT FILING DATE: 1998-12-23
NUMBER OF SEQ ID NOS: 50
SOFTWARE: PATENTIN VET: 2.1
SEQ ID NO 48
LENGTH: 595
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               339 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPAGPPGARGQA 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         279 GPPGPAGEEGKRGARGEPGPSGLPGPPGERGGPGSRGFPGADGVAGPKGPSGERGAPGPA 338
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 GPP:-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: PRT
ORGANISM: Artificial Sequence
FEATURE:
OTHER INFORMATION: Description of Artificial Sequence: Synthetic
OTHER INFORMATION: amino acid sequence
US-09-219-849-50
                                                                                                                                                                                                                                                                                                                                                                                                  PEATURE:
OTHER INFORMATION: Description of Artificial Sequence: Synthetic
OTHER INFORMATION: amino acid sequence
19.09-219-849-48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ouery Match

94.3%; Score 1116; DB 3; Length 595;
Best Local Similarity 90.5%; Pred. No. 1.9e-70;
Matches 199; Conservative 4; Mismatches 5; Indels 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                        TYPE: PRT
ORGANISM: Artificial Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 10
US-09-219-849-50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
```

```
APPLICANT: VAN HERRDE, GEORGE V.
APPLICANT: VAN HERRDE, GEORGE V.
APPLICANT: VAN HERRDE, GEORGE V.
APPLICANT: VAN RINH, ALEXIS C.
APPLICANT: BOUWSTRA, JAN B.
APPLICANT: BOUNGTRA, JAN B.
APPLICANT: WO DEN WOLF, FREDERIK A.
APPLICANT: WIND, RICHELE D.
APPLICANT: WIND, RICHELE D.
APPLICANT: WIND, RICHELE D.
APPLICANT: WIND, RICHELE D.
APPLICANT: WIND SILVER HALIDE EMILSIONS WITH RECOMBINANT COLLAGEN
TITLE OF INVENTION: SILVER HALIDE EMILSIONS WITH RECOMBINANT COLLAGEN
TITLE OF INVENTION: SILVER HALIDE EMILSION AND ALSO THE
TITLE OF INVENTION: PREPARATION THEREOF
TITLE OF INVENTION NUMBER: US/09/219,849
CURRENT APPLICATION NUMBER: US/09/219,849
CURRENT FILING DATE: 1998-12-23
NUMBER OF SEQ ID NOS: 50
SOFTWARE: PATENTIN VOFF. 2.1
SEQ ID NO 49
LENGTH: 822
TURNENT PROBLEM SECONDER S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                399 GVMGFPGPKGTAGEPGKAGERGLPGPPGAVGPAGKDGEAGAQGAPGPAGPAGEKGEQGPA 458
                                                                                                                                                                                                                                                                            49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   399 GVMGFPGPKGTAGEPGKAGERGLPGPPGAVGPAGKDGEAGAGAGGAPGPAGPAGPAGERGEQGPA 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   279 GPPGPAGEEGKRGARGEPGPSGLPGPPGERGGPGSRGFPGADGVAGPKGPSGERGAPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                           1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12; Gaps
                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OTHER INFORMATION: Description of Artificial Sequence: Synthetic OTHER INFORMATION: amino acid sequence
                                                                                                           12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 822;
          Length 595;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                           5; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSPGFOGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    459 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 498
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match

94.3%; Score 1116; DB 3;
Best Local Similarity 90.5%; Pred. No. 2.6e-70;
Matches 199; Conservative 4; Mismatches 5;
/ Match 1116; DB 3; Score 1116; DB 3; Local Similarity 90.5%; Pred. No. 1.9e-70; nes 199; Conservative 4; Mismatches 5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-219-849-49; Sequence 49; Application US/09219849; Patent No. 61550081.
GENERAL INFORMATION:
APPLICANT: VAN HEERDE, GEORGE V.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM: Artificial Sequence
```

```
FILE REFERENCE: 1010/16959-US3
CURRENT APPLICATION NUMBER: US/08/468,996
CURRENT FILIANIO DATE: 2003-02-07
PRIOR APPLICATION NUMBER: US 07/843,752
PRIOR FILING DATE: 1992-02-28
PRIOR FILING DATE: 1990-02-21
PRIOR FILING DATE: 1990-02-21
PRIOR FILING DATE: 1990-02-21
PRIOR FILING DATE: 1990-02-24
PRIOR FILING DATE: 1990-02-24
PRIOR FILING DATE: 1990-02-24
PRIOR FILING DATE: 1990-03-02
PRIOR PILING DATE: 1990-03-02
PRIOR FILING DATE: 1990-03-02
PRIOR FILING DATE: 1990-03-02
PRIOR FILING DATE: 1990-03-02
PRIOR PILING DATE: 1990-03-02
PRIOR PILING DATE: 1990-10-31
PRIOR PILING DATE: 1990-10-10
PRIOR PILING DATE: 1990-10-31
PRIOR PILING DATE: 1990-10-31
PRIOR PILING DATE: 1990-10-31
PRIOR PILING DATE: 1990-10-31
PRIOR PILING DATE: 1990-10-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            472 GPPGEAGKPGDQGVPGEAGAPGLVGPRG 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: EP 96202596.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US-08-931-820-3
; Sequence 3, Application US/08931820
; Patent No. 6010863
; GENERAL INFORMATION:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FILING DATE:
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; ORGANISM: Homo sapiens US-08-468-996-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     a
                                                                                                                                  APPLICANT: Weiner, Howard
APPLICANT: Weiner, Ariel
APPLICANT: Miller, Ariel
APPLICANT: Alend, Al-Sabbagh
TITLE OF INVENTION: BYSTANDER SUPPRESSION OF TYPE 1 DIABETES BY ORAL ADMINISTRATION
FILE REFERENCE: 1010/1659-US3
CURRENT APPLICATION NUMBER: US/08/468,996
CURRENT FILING DATE: 2003-02-07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Weiner, Howard
APPLICANT: Miller, Ariel
APPLICANT: Zheng, Zhengi
APPLICANT: Ahmad, Al-sabbagh
APPLICANT: Ahmad, Al-sabbagh
TITLE OF INVENTION: BYSTANDER SUPPRESSION OF TYPE 1 DIABETES BY ORAL ADMINISTRATION -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    280 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGAPGPA 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           400 GVMGFPGPKGAAGEPGKAGERGVPGPP-----GNDGAKGDAGAPGLPGPKGDRGDAGPK 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        76.7%; Score 908; DB 4; Length 492 76.0%; Pred. No. 4.2e-56;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           25; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSG 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR FILING DATE: 1992-02-28
PRIOR FILING DATE: 1992-02-28
PRIOR FILING DATE: 1992-02-28
PRIOR FILING DATE: 1990-02-21
PRIOR APPLICATION NUMBER: US 07/65,936
PRIOR APPLICATION NUMBER: US 07/55,734
PRIOR APPLICATION NUMBER: US 07/65,734
PRIOR FILING DATE: 1990-10-15
PRIOR PELING DATE: 1997-06-24
PRIOR PILING DATE: 1999-12-20
PRIOR APPLICATION NUMBER: US 07/484,486
PRIOR FILING DATE: 1990-03-02
PRIOR FILING DATE: 1990-07-10
PRIOR FILING DATE: 1990-07-10
PRIOR PILING DATE: 1990-07-14
PRIOR PILING DATE: 1990-07-14
PRIOR FILING DATE: 1990-10-31
                                          Sequence 12, Application US/08468996 Patent No. 6645504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 10, Application US/08468996
Patent No. 6645504
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity 76.0°
Matches 165; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; TYPE: PRT
; ORGANISM: Bos taurus
US-08-468-996-12
       US-08-468-996-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         US-08-468-996-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             · à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
```

```
61 GEAGLPGAKGLTGSPGSPGFDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                    352 GEPGLPGARGLIGRPGDAGPQGKVGPSGAPGEDGRPGPPGPPGPPGPARGOPGPKGAN 411
                                                                                                                                                                                                                                                                                                                                                                                          121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                           471
                                                                                                                                                                                                                                                                                                                                                                                                                                   412 GEPGKAGEKGLPGAPGLRGLPGKDGETGAEGPPGPAGPAGERGEQGAPGPSGFQGLPGPP
                                                                                                                                  1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                        Gaps
                                                                    ö
Query Match 73.1%; Score 866; DB 4; Length 1017; Best Local Similarity 74.5%; Pred. No. 6.6e-53; Matches 155; Conservative 11; Mismatches 42; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: Patentin Release #1.0, Version #1.25 (EPO) CURRENT APPLICATION DATA: APPLICATION NUMBER: US/08/931,820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TITLE OF INVENTION: Assay for collagen degradation NUMBER OF SEQUENCES: 4
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
```

```
Search completed: September 24, 2004, 11:09:49 Job time : 10.6042 secs
                      1418 amino acids
                                                                                                                                                                                                                                   Query Match
Best Local Similarity 74.0%
Matches 154; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 20, Application US/08963825
Sequence 20, Application US/08963825
Patent No. 611069

GENERAL INFORMATION:
APPLICANT: Bonde Martin
TITLE OF INVENTION: A Method for Assaying Collagen Fragments
TITLE OF INVENTION: in Body Fluids, A Test Kit and Means for Carrying Out the TITLE OF INVENTION: Disorders Associated with the Metabolism of NUMBER OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
ADDRESSEE: Darby & Darby PC
                                                                                                                                                                                                                                                                                                                                                                    311 GARGEPGGVGPIGPPGERGAPGNRGFPGQDGLAGPKGAPGERGPSGLAGPKGANGDPGRP 370
                                                                                                                                                                                                                                                                                                                                                                                                                                                       431 GEPGKAGEKGLPGAPGLRGLPGKDGETGABGPPGPAGPAGERGEQGAPGPSGFQGLPGPP 490
                                                                                                                                                                                                                                                                                                                                                                                                                                 GEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                             1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRP
                                                                                                                                                                                                                                                          12.8%; Score 862; DB 3; Length 1060; ilarity 74.0%; Pred. No. 1.3e-52; Conservative 11; Mismatches 43; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET: 865 Third Avenue
CITY: New York
STATE: New York
COUNTRY: USA
ZIP: 10022
COMPTRY: USA
COMPTRY: BEADABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION DATA:
APPLICATION NUMBER: US/08/963,825
FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION: 436
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/08/187,319
PILING DATE: 21-JAN-1994
ATTORNEY/AGENT INFORMATION:
NAME: GGGOTIS, Adda C
REGISTRATION NUMBER: 29,714
REFERENCE/DOCKET NUMBER: 4305/08701
TELECOMMUNICATION INFORMATION:
SEQUENCE CHARACTERISTICS:
LENGTH: 1060 amino acids
TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: protein
HYPOTHETICAL: NO
ORIGINAL SOURCE:
CRGANISM: Homo sapiens
IISSUE TYPE: Collagen type II
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            E: Darby & Darby PC
805 Third Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TELEX: 236687
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            212-753-6237
                                                                                                                                                                                                                                                                                Best Local Similarity
Matches 154; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 15
US-08-963-825-20
                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                              Query Match
                                                                                                                                                                                                                                                                                                                                                                                      d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                   ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
```

```
482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61 GEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 GEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               543 GEPGKAGEKGLPGAPGLRGLPGKDGETGAEGPPGPAGPAGERGEGGAPGPSGFQGLPGPP 602
                                                                                                                                                                                                                                                                                                                                                                1 GPPGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGBAGRP
                                                                                                                                                                                                                                                                                                                                                                                                            423 GARGEPGGVGPIGPPGERGAPGNRGFPGQDGLAGPKGAPGERGPSGLAGPKGANGDPGRP
                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                      Length 1418;
                                                                                                                                                                                                                                                                                                                    43; Indels
                                                                                                                                                                                                                                                                   72.8%; Score 862; DB 3; 74.0%; Pred. No. 1.7e-52; tive 11; Mismatches 43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181 GPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            603 GPPGEGGKPGDÓGVPGEAGAPGLVGPRG 630
                                            TYPE: amino acid

TYPE: amino acid

TYPE: DebLocy: linear

MOLECULE TYPE: protein

ORGANISM: Homo sapiens

IMMEDIATE SOURCE:

CLONE: COLLAGEN - ALPHA 1 (II)

US-08-961-825-20
SEQUENCE CHARACTERISTICS
```

This Page Blank (uspto)

Human nov Human Tum Human pan Human car Human cer Human src Human pro Human Pro Human Pro Human Pro Human Pro Human Pro

Abb90764 Abb88610 Abus48611 Abr92064 Abr92064 Add45051 Add45051 Ade87051 Ade87051 Ade87051 Ade87051 Ade87051 Ade87051 Ade87051 Ade87051 Ade87051 Add45057 Add45057

Human pan Porcine a Amino aci Bovine al Novel hum Rat Prote Rat Prote Rat Prote

6

```
ABR47417
ABR92064
ABR92064
ADD45059
ADD45059
ADD45059
ADB87051
(without alignments)
2065.614 Million cell updates/sec
                                      September 24, 2004, 11:06:55 ; Search time 28.5883 Seconds
                                                                  1184
1 GPPGEPGPTGLPGPPGERGG......GEQGVPGDLGAPGPSGPAGG 209
     GenCore version 5.1.6 (c) 1993 - 2004 Compugen Ltd.
                                                                                                             Total number of hits satisfying chosen parameters:
                                                                                                   1586107 segs, 282547505 residues
                           - protein search, using sw model
                                                                                  BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                            US-10-658-989A-1
          Copyright
```

score:

Title: Perfect sc Sequence:

protein

ĕ

Run on:

Scoring table:

Searched:

## ALIGNMENTS

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

length: 0 length: 2000000000

Minimum DB seq Maximum DB seq

A Geneseq 29Jan04:\*

Database

genesequi980s:\* genesequi990s:\* genesequi2001s:\* genesequi2001s:\* genesequi2002s:\* genesequi2003as:\* genesequi2003as:\*

geneseqp2004s:

SUMMARIES

Aab68057 Amino aci Aae02703 Human alp Adb84290 Recombina Aay84541 Amino aci

AAB68057

DB

Length

Query Match

Result

Description

A human call and aci collagen/Amino aci Amino aci Amino aci Collagen/Amino aci Collagen/Aciment pan Collagen Collagen Amino aci Collagen/Amino aci Collagen/Amino aci Collagen/Amino aci Human per Human poe

Adba4290 F Aay84541 Aay844634 Aay844603 Aar89472 Aar89450 Aar89450 Aar89460 Aar89470 Aar89470 Aar89470 Aar896122 Aar896122 Aar89471 Aar89471 Aar89471 Aar89471 Aar89471 Aar89471 Aar89471 Aar89471 Aar89485 Aab89474 Aar86485 Aab89474 Aar86485 Aab89474 Aar89486

AABC2703 AAD84220 AAD84240 AAX84544 AAX89472 AAX89453 AAX89453 AAX84537 AAX84538 ADB7062 AAX84538 ADB7062 AAX84538 ABB09625 ABB09625 AAX8971701 AAY8671701 AAY86734 ABB09625

AAW68485 AAB82454

```
Human, recombinant galatin, binding agent, stabilising agent; emulsifier, encapsulant, film-forming agent, moisturising agent, thickening agent; epelling agent; colloidal agent; adhesive agent; gel capsule; photography, plasma expander; colloidal volume replacement material; graft coating; medical sponge; medical plug, micro-carrier; edible composition, protein supplement; fat substitute, nutritional supplement; cell culture; edible coating; cosmetic; vaccine; therapy; arthritis; athrosis; cartilage degeneration; joint flexibility; food industry; beverage; alphal (1) type I collagen.
                                                                                                                                                                                                                                                                             399
                                                                                                                                                                                                                                                                                                                          GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 459
                                                                                                                                                                                                                                                    48
diphtheria, tetanus, Varicella-Zoster (chicken pox/shingles), pertussis (whooping cough), Bacille Calmette-Geurin (BCG, tuberculosis), haemophilus influenzae meningitis, rabies, cholera, Japanese encephalits virus, salmonella typhi, shigella, hepatitis A and B, adenovirus, yellow fever, foot and mouth disease, herpes simplex virus, respiratory syncytial virus, rotavirus, Dengue, West Nile virus, turkey herpes virus (Marek's disease), influenza and/or anthrax
                                                                                                                                                                                                                                                                                                                                                   940 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGSPGPDGKIGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                    1 GPP-----GEPGPIGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Human alphal (I) type I collagen helical domain (residues 179-679)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gelatin useful for pharmaceuticals, cosmetics and edible foods, is
                                                                                                                                                                                                                  12;
                                                                                                                                                                               97.0%; Score 1149; DB 4; Length 501; illarity 93.6%; Pred. No. 3.5e-67; Conservative 0; Mismatches 2; Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Polarek JW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPARG 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Olsen DR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 21; Page 121-123; 137pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAE02703 standard; protein; 501 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Neff TB,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12-NOV-1999; 99US-0165114P.
15-MAY-2000; 2000US-0204437P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10-NOV-2000; 2000WO-US030791
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Chang RC, Kivirikko KI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      prepared recombinantly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (FIBR-) FIBROGEN INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 2001-329072/34.
                                                                                                                                                                               Query Match
Best Local Similarity
Matches 206; Conserv
                                                                                                                                               Sequence 501 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WO200134646-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  06-AUG-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     17-MAY-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAE02703;
                                                                                                                                                                                                                                                                                      280
                                                                                                                                                                                                                                                                                                                        49
                                                                                                                                                                                                                                                                                                                                                                                                109
                                                                                                                                                                                                                                                                                                                                                                                                                                  400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAE02703
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          88888888888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                   ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                            qq
                                                                                                                                                                                                                                                                               임
                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
```

```
The patent discloses recombinant human gelatin which is useful in various compositions including binding agents, encapsulants, stabilishing agents, film-forming agents, moisturising agents, emulsifiers, thickening agents, gelling agents, colloidal agents, moisturising agents, pharmaceutical compositions, hard gel capsules, soft gel capsules, pharmaceutical capsules, soft gel capsules, plasma expander, colloidal volume replacement materials, graft coatings, medical sponges, medical plugs, pharmaceutical stabilisers, micro-carriers, edible compositions, protein supplements, fat substitutes, nutritional supplements, fat substitutes, nutritional compositions, industrial composition, call culture compositions and compositions for use in the laboratory. Pharmaceutical compositions and compositions for use in the laboratory. Pharmaceutical compositions and compositions accombant gelatin are used as vaccines. They are also used to treat various joint conditions such as arthritis, athrosis and other flexibility. Recombinant gelatin is also used in food and beverage industries. The present sequence is human alphal (1) type I collagen helical domain (residues 179-679). This sequence is a recombinant gelatin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        400 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 virucide; antitussive; tuberculostatic; antibacterial; antiinflammatory;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    heparotropic, vaccine, recombinant gelatin, vaccinia virus, small pox; polio virus; Salk and Sabin; mumps; measles, rubella; diphtheria; tetanus; Varicella-Zoster; chicken pox; Shingles; pertussis; whopping cough, Bacille Calmette-Guerin; BGG; tuberculosis; Haemophilus influenzae; meningitis; rabies; cholera; Japanese encephalitis virus; Salmonella typhi; Shigella; hepatitis A; hepatitis B; adenovirus; yellow fever; foot and mouth disease; herpes simplex virus; respiratory syncytial virus; rotavirus; dengue; west Nile virus; Turkey herpes virus; Marek's disease; influenza;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           340 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGPRGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                               97.0%; Score 1149; DB 4; Length 501; 93.6%; Pred. No. 3.5e-67; tive 0; Mismatches 2; Indels 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                anthrax; collagen type 1; alpha1(I)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADB84290 standard; protein; 501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          30-AUG-2002; 2002US-00232175.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity 93.6 Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Recombinant gelatin #3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 501 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US2003064074-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              04-DEC-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 03-APR-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADB84290;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 3
ADB84290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \stackrel{>}{\circ}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  유
```

12-NOV-1999;

us-10-658-989a-1.rag

```
trans-4-hydroxyproline, 3-hydroxyproline, recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation.
                                                                                                                                                                                                                                                                                                                                                                Disclosure; Fig 27A-E; 260pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 5
AAY84544
ID AAY84544 standard; protein; 1057 AA.
                                                                                                                                                                                                                            Zhang G,
                                                                                                                                                                  98US-00169768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity 93.6%;
Matches 206; Conservative (
                                                                                                                                                                                                                            Buechter DD,
                                                                                                                                                                                             (USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                       WPI; 2000-259138/23.
N-PSDB; AAA12502.
                                                                                                                                                                                                                                                                                                                                  medical implants.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 1057 AA;
                                                                                                                                    07-OCT-1999;
                                                                                                                                                                 09-OCT-1998;
                                                                          EP992586-A2.
                                                                                                                                                                                                                            Gruskin EA,
   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                            The invention describes a vaccine composition comprising a recombinant gelatin, and an antigenic agent. The vaccine can be delivered by infection, through masal, oral, transdermal or mucosal routes, or through delivery. Administration may also be oral, rectal, transmucosal, intestinal, or parenteral (e.g. intraneuricular, intravence subcuraneous, intranedullary, intraocentacini, intravencini, intravence intraperationeal, intranagal or intraocenta intravence (small composition is formulated for the prevention of vaccinia virue (small pox), polio virue (salk and Sabin), mumps, meaales, rubella, diphtheria, tetanus, Varicella-Zoster (chicken pox/shingles), pertussis (whopping cough), Bacille Calmette-Guerin (BCG, tuberculosis), Haemophilus influenzae meniggitis, rabies, cholera, dapanese encephalitis virus, cough), Shigella hepatitis A, hepatitis B, adenovirus, yellow fever, foot and mouth disease, hepres simplex virus, respiratory syncytial virus, rotavirus, dengue, Mest Nile virus, Turkey herpes virus (Marek's disease), influenza, and anthrax. This is the amino acid sequence of a recombinant gelatin used in the creation of a vaccine composition of the invention.
                                                                                                                                                                                            New vaccine composition comprising a recombinant gelatin and an antigenic agent, useful for preventing e.g. polio virus, mumps, measles, rubella, diphtheria, tetanus, chicken pox/shingles, pertussis, cholera, rotavirus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             340 GPKGSPGEAGRPGEAGLPGAKGLIGSPGSPGPDGKTGPPGPAGQDGRPGPPGPRGARGQA 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              280 GPPGPAGEEGKKGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Extracellular matrix protein; self aggregation; hydroxylated proline;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 97.0%; Score 1149; DB 7; Length 501; Best Local Similarity 93.6%; Pred. No. 3.5e-67; Matches 206; Conservative 0; Mismatches 2; Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Amino acid sequence of a human collagen 1 (alpha1) protein.
                                                                                                                                    Polarek JW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPGFQGLPGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                    Olsen DR,
                                                                                                                                                                                                                                                                     Claim 16; Page 36-38; 63pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY84541 standard; protein; 1057 AA
                                                                                                                                  Neff TB,
 15-MAY-2000; 2000US-0204437P.
10-NOV-2000; 2000US-00710249.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                 Kivirikko KI,
                                                       KIVIRIKKO K I.
NEFF T B.
OLSEN D R.
POLAREK J W.
                                                                                                                                                               WPI; 2003-540775/51
                                            CHANG R C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 501 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  25-JUL-2000
                                                                                                                                  Chang RC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    400
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAY84541;
                                                       (KIVI/)
(NEFF/)
(OLSE/)
                                                                                                      (POLA/)
                                           (CHAN/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 4
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ð
```

```
The specification describes a method for producing an extracellular matrix protein or its fragment. The extracellular matrix protein is capable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by the cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the incorporating the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-hydroxyproline and 3-hydroxyproline and a lincorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins. This is especially useful in the recombinant production of proteins such as collagen, fibrinogen and proteins depends on the post translational hydroxylation of proteins. The method is also useful in studying the structure and function of protein. The present sequence represents a human collagen! (alphal) protein, which may be produced using the method of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Production of extracellular matrix proteins containing 4-trans-
hydroxyproline results in native self aggregating proteins, useful on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPPGPDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      417 GVMGFFGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              477 GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 1149; DB 3;
Pred. No. 6.4e-67;
0; Mismatches 2;
Connolly K;
```

```
The specification describes a method for producing an extracellular matrix protein or its fragment. The extracellular matrix protein is capable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by that cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-hydroxyproline to allow at least one of the amino acids to be assimilated into the cell and incorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins the sespecially useful in the recombinant production of proteins such as collagen, fibrinogen and proteins depends on the post translational hydroxylation of proline. The method is also useful in studying the structure and function of proteins depends which do not normally contain trans-4-hydroxyproline. The present sequence represents human collagen 1 (alphal) helical region, which may be produced using the method of the invention
                                                                                                                                          Extracellular matrix protein; self aggregation; hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Production of extracellular matrix proteins containing 4-trans-hydroxyproline results in native self aggregating proteins, useful on medical implants
                                                                                                    A human collagen 1 (alphal) protein helical region.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Example 10; Fig 39A-E; 260pp; English.
                                                            25-JUL-2000 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                           (USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI: 2000-259138/23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 1057 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-PSDB; AAA12503
                                                                                                                                                                                                                                                                                                                                                                                                   09-OCT-1998;
                                                                                                                                                                                                                                  Homo sapiens
                                                                                                                                                                                                                                                                                                                                                        07-OCT-1999;
                                                                                                                                                                                                                                                                          EP992586-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gruskin EA,
                                                                                                                                                                                                                                                                                                              12-APR-2000
                    AAY84544;
```

몫

Connolly

Zhang G,

Buechter DD,

99EP-00119184. 98US-00169768.

```
The present sequence represents a human type 1 (alphal) collagen protein. Peptides derived from the protien were used to demonstrate incorporation of 3.4-derydron-large into the peptide, using the method of the invention. The specification describes a method for the incorporation non-natural amino acid into a polypeptide. The method comprises reacting at least one 3.4-derydroproline residue in the polypeptide with an epoxyproline residue. The method is used for studying the effects of non-natural amino acids on structure and function of polypeptides. The method is also useful for commercial production of collagen or mussel adhesive proteins (which are useful as bloadnesives), and for incorporating a wice variety of groups, including therapeutic ligands and biological probes,
                                                                                                                                                                                                                                    Alphal collagen; 3,4-dehydro-L-proline; epoxidation; 3,4-epoxyproline; collagen; mussel adhesive protein; bloadhesive.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            298 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                e.9
                                                                                                                                                                                                       Amino acid sequence of human type 1 (alphal) collagen polypeptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Incorporating non-natural amino acid into polypeptide, useful production of bioadhesives, by epoxidation or substitution of dehydroproline residues.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1058;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
             477 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 516
169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 1149; DB 3;
Pred. No. 6.4e-67;
0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Buechter DD
                                                                                                           Ź
                                                                                                           AAY84403 standard; protein; 1058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Disclosure; Fig 6; 66pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    97.0%;
                                                                                                                                                                                                                                                                                                                                                                                    99WO-US020462
                                                                                                                                                                                                                                                                                                                                                                                                                 98US-0099652P
                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Paolella DN, Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                 USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PAOLELLA D N.
GRUSKIN E A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BUECHTER D D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2000-271051/23.
N-PSDB; AAZ99843.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      into polypeptides
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 1058 AA;
                                                                                                                                                                                                                                                                                                                      WO200014201-A1
                                                                                                                                                                                                                                                                                                                                                                                                                  09-SEP-1998;
                                                                                                                                                                                                                                                                                       Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                    07-SEP-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Local Simi
                                                                                                                                                                          12-JUL-2000
                                                                                                                                                                                                                                                                                                                                                   16-MAR-2000.
                                                                                                                                           AAY84403;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (PAOL/)
(GRUS/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 BUEC/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Loca
Matches
                                                                                            AAY84403
                                                                              RESULT
ઠે
                           셤
                                                                                                              ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  297 GPPGPAGEEGKKGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     48
```

for

Ä

Gaps

357 108 417

48

109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168

ò

GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGFDGKTGPPGPAGODGRPGPPGPPGAKGQA

357 109

qq

à

à

ద

à

GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA

Query Match 97.0%; Score 1149; DB 3; Length 1057; Best Local Similarity 93.6%; Pred. No. 6.4e-67; Matches 206; Conservative 0; Mismatches 2; Indels 12.

12; Gaps

GVMGFPGPKGAAGEPGKAGEKGVPGPPGAVGPAGKDGEAGAQGPPGPAGEKGEQGPA

12;

Indels

```
Matches
                                                                                                                                                                                                                                                                                                                                                                              AAY844540
ID AAY84546
ID AAY84546
AAY846
AAY846
AAY846
AAY846
AAY846
AAY86

                                              à
                                                                           g
                                                                                                                          à
                                                                                                                                                         g
                                                                                                                                                                                                     ठे
                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                     ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Chimaeric DNA encoding protein contg. extracellular matrix protein domain - and cellular regulatory factor domain, partic. useful as osteogenic agents, also related vectors, transformed cells and chimaeric proteins.
A fusion protein (AAR89472) comprises the alpha-helical region of human collagen I(a) linked to amino acids 46-93 of human mature dermatan sulphate proteoglycan (decorin). It can be expressed in Escherichia colitansformants carrying a vector incorporating a chimeric gene (AAT16518) coding for the fusion. The decorin binds to type I collagen and thus affects Elbril formation. It inhibits the cell attachment-promoting activity of collagen and fibrinosen by binding to such molecules near their cell binding sites. The collagen moiety provides an integral substratum or scaffolding for the decorin. The fusion protein acts to
                                                                                                                                                                                                                                                                                                                                                             Transforming growth factor; TGF-beta-1; collagen IA; osteogenesis;
bone formation; tissue repair; fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "amino acids P46 to G93 of mature decorin"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1107;
                                                                                                                                                                                                                                                                                                                                                                                                                                      Location/Qualifiers
1. .1057
/label= Collagen-IA
/note= "collagen IA alpha-helical domain"
                                                             GSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGPAG 208
                                                                                          GSPGFQGLPGPAGPPGBAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            note= "unidentified amino acid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  acid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 1149; DB 2;
Pred. No. 6.6e-67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  note= "unidentified amino
                                                                                                                                                                                                                                                                                                                     Collagen/decorin(aa46-93) fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1058. 1059
| label= Linker_peptide
| 1060. 1107
| label= Decorin
                                                                                                                                                                                                   AAR89472 standard; protein; 1107 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             reduce scarring of healing tissue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Disclosure, Fig 8; 59pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         95CA-02151547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94US-00259263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           97.0%;
93.6%;
                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (USSU ) US SURGICAL CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Espino P;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 1996-140144/15.
N-PSDB; AAT16518.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1107 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       12-JUN-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gruskin EA,
                                                                                                                                                                                                                                                                               01-OCT-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CA2151547-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11-DEC-1995
                                                                                                                                                                                                                                                                                                                                                                                                                        Synthetic
                                                             169
                                                                                                478
                                                                                                                                                                                                                                         AAR89472;
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Key
Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Domain
                                                                                                                                                                                  AAR89472
                                                                                                                                                             RESULT
                                                                                                                                                                                                                      음
                                                          ઠ
                                                                                              셤
```

```
۲;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       matrix protein or its fragment. The extracellular matrix protein is capable of self aggregating in a cell which does not ordinarily dydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by that cell for naturally occurring codors not preferred by that cell for naturally occurring codors not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-hydroxyproline to allow at least one of the amino acids to be assimilated
                                                                                                                                                                              108
                                                                                                                                                                                                                                                                                                                                                                   476
                                                                                          297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGEKGSPGERGSPGPA 356
                                                                                                                                                                                                                                           416
                                                                                                                                                                                                                                                                                                  109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Extracellular matrix protein; self aggregation; hydroxylated proline;
trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production;
collagen; fibrinogen; fibronectin; post translational hydroxylation;
decorin; ohimera.
                                                             48
                                                                                                                                                                                                                     357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Amino acid sequence of a chimeric collagen 1 (alphal)/decorin protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Production of extracellular matrix proteins containing 4-trans-
hydroxyproline results in native self aggregating proteins, useful on
medical implants.
                                                                                                                                                                                 49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                417 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                          1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The specification describes a method for producing an extracellular
                                                                                                                                                                                                                                                                                                                                                                                                                             GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 꿌
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Connolly
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note= "Gly encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ΰ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY84540 standard; protein; 1107 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Zhang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 24; Fig 18; 260pp; English.
;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99EP-00119184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98US-00169768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    USSU ) US SURGICAL CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2000-259138/23.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        N-PSDB; AAA12500.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Key
Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Homo sapiens.
Unidentified.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            07-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         09-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                25-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EP992586-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                             169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY84540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chimeric.
```

```
method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins. This is especially useful in the recombinant production of proteins such as collagen, fibrinogen and fibronectin whose ability to self aggregate and produce functional proteins depends on the post translational hydroxylation of proline. The method is also useful in studying the structure and function of polypeptides which do not normally contain trans-4-hydroxyproline. The present sequence represents a chimeric collagen 1 (alphal)/decorin protein, which may be produced using the method of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGBPGARGQA 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GWGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 New pancreatic specific nucleic acid molecule or protein for diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer or non-cancerous disease states of the pancreas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 356
the cell and incorporated into the extracellular matrix protein. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              --GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This invention relates to novel nucleic acids and proteins present in normal and neoplastic pancreatic cells. Pancreatic cancer is a common
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          neoplastic pancreatic cell; pancreatic cell; pancreatic cancer; cancer death; cytostatic; vaccine; gene therapy; non-cancerous pancreas disease; human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1149; DB 3; Length 1107;
Pred. No. 6.6e-67;
0; Mismatches 2; Indels 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPGFQGLFGFPAGPPGEAGKPGEQGVPGDLGAPGFSGARG 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Human pancreatic cell protein sequence SeqID510.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADE87050 standard; protein; 1161 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 12; SEQ ID NO 510; 635pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        97.0%;
93.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21-DEC-2001; 2001US-0342768P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  19-DEC-2002; 2002WO-US040655.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity 93.6
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GPP-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 2003-587286/55.
N-PSDB; ADE87387.
                                                                                                                                                                                                                                                                                                                                                                                      Sequence 1107 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (DIAD-) DIADEXUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WO2003060145-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29-JAN-2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-JUL-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ADE87050;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sun Y,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ношо
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 9
ADE87050
ADE87050
ADE87050
ADE87050
ADE87050
ADE87050
ACANOMIC STATES
8888888888888888
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
```

```
ä
                                                                                                                                                                                                                                                 108
                                                                                                                                                                                                                                                                                                                   8
         and treatment are required. Compounds which modulate the proteins of the invention may have cytostatic activity and the protein and DNA sequences of the invention may be useful for the development of a vaccine or in gene therapy. The composition and methods are useful in diagnosing, staging, monitoring, preventing or treating pancreatic cancer and non-cancerous disease states of the pancreas. The present sequence it that of a human pancreatic protein of the invention.
                                                                                                                                                                                            1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                         215 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                     GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                    Gaps
                                                                                                                                                                   12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        osteogenesis;
cause of cancer death worldwide, therefore accurate methods of
                                                                                                                                          Length 1161;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Location/Qualifiers
1. .1057
/label= Collagen-IA
/note= "collagen IA alpha-helical domain"
                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                       GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG 374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      morphogenic protein 2B; BMP-2B; collagen IA;
                                                                                                                                        Query Match
97.0%; Score 1149; DB 7;
Best Local Similarity 93.6%; Pred. No. 6.9e-67;
Matches 206; Conservative 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     'note= "unidentified amino acid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              amino acid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "human mature BMP-2B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1058. .1059
/label= Linker_peptide
1060. .1169
/label= BMP-2B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             'note= "unidentified
                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAR89469 standard; protein; 1169 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Collagen/BMP-2B fusion protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             95CA-02151547
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-OCT-1996 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (USSU ) US SURGICAL CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Espino P;
                                                                                                                   Sequence 1161 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12-JUN-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       10-JUN-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11-DEC-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Synthetic
                                                                                                                                                                                                                                                  49
                                                                                                                                                                                                                                                                                                     109
                                                                                                                                                                                                                                                                                                                                                                                335
                                                                                                                                                                                                                                                                                                                                                        169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Key
Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Domain
 8888888888
                                                                                                                                                                                                ઠ
                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                  ઠે
                                                                                                                                                                                                                                                                         셤
                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                        ઠે
                                                                                                                                                                                                                                                                                                                                                                             g
```

Production of extracellular matrix proteins containing 4-trans-hydroxyproline results in native self aggregating proteins, useful on medical implants.

Connolly K;

Ö

Zhang

Buechter DD,

Gruskin EA,

WPI; 2000-259138/23

N-PSDB; AAA12497

(USSU ) US SURGICAL CORP

98US-00169768

09-OCT-1998;

```
Chimaeric DNA encoding protein contg. extracellular matrix protein domain - and cellular regulatory factor domain, partic. useful as osteogenic agents, also related vectors, transformed cells and chimaeric proteins.
                                                                                                                                                                                                                                                                                                                                                                                                                             111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 111 | 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGFDGKTGPPGPAGQDGRPGPPGPFGPAGQA 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Extracellular matrix protein, self aggregation, hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation; ss. bone morphogenic protein; BMP-28; chimera.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA 108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                           A fusion protein (AAR89469) comprises the alpha-helical region of human collagen I(a) linked to the human mature bone morphogenic protein 2B (BMP2B). It can be expressed in Escherichia coll transformants carrying vector incorporating a chimeric gene (AAT16515) coding for the fusion. The BMP moiety induces osteogenesis, while the collagen moiety provides an integral substratum or scaffolding for the BMP and cells involved in reconstruction and growth. The fusion protein provides sustained release and delivery of BMP to a target tissue
                                                                                                                                                                                                                                                                                                                                                                                                  1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Amino acid sequence of a chimeric collagen 1 (alphal)/BMP-2B protein.
                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                   12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ĽĽ)
                                                                                                                                                                                                                                                                                                                                   DB 2; Length 1169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         note= "unspecified amino acid encoded by
                                                                                                                                                                                                                                                                                                                                                                 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note= "unspecified amino acid encoded
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                               Score 1149; DB 2
Pred. No. 7e-67;
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           note= "Ala encoded by G"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ź
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY84537 standard; protein; 1169
                                                                                                                 English
                                                                                                                                                                                                                                                                                                                               97.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               99EP-00119184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                   Matches 206; Conservative
                                                                                                                 Disclosure; Fig 5; 59pp;
WPI; 1996-140144/15.
N-PSDB; AAT16515.
                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             890
                                                                                                                                                                                                                                                                                                     Sequence 1169 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Homo sapiens.
Unidentified.
Chimeric.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              07-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EP992586-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     477
                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY84537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         쉱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
```

```
The specification describes a method for producing an extracellular matrix protein or its fragment. The extracellular matrix protein is capable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by that cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-hydroxyproline to allow at least one of the amino acids to be assimilated into the cell and incorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins. This is especially useful in the recombinant production of proteins such as collagen, fibrinogen and fibronectin whose ability to self aggregate and produce functional proteins depends on the post translational hydroxyproline. The method is also useful in studying the structure and function of proteins equence represents a chimaric collagen 1 (alphal)/bone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   417 GVMGPPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       morphogenic protein-2B (bmp-2b) protein, which may be produced using the method of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGBAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Transforming growth factor; TGF-beta-1; collagen IA; osteogenesis; bone formation; tissue repair; fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1149; DB 3; Length 1169;
Pred. No. 7e-67;
0; Mismatches 2; Indels 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               169 GSPGFPGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dsperodipepageperackperodicapepseard 516
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Collagen/TGF-beta-1 fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  standard; protein; 1171
                                                                                                                                                                                                                                                              Claim 22; Fig 13; 260pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity 93.6%;
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1169 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-OCT-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAR89470;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAR89470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAR89470
IID AAR8
XX
AC AAR8
XX
DT 01-C
XX
DDE CO11
XX
KW Tran
KW bone
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 음
ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
```

ï

AAY84538 standard; protein; 1171 AA

```
Chimaeric DNA encoding protein contg. extracellular matrix protein domain - and cellular regulatory factor domain, partic. useful as osteogenic agents, also related vectors, transformed cells and chimaeric proteins.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A fusion protein (AAR89470) comprises the alpha-helical region of human collagen I(a) linked to the human mature transforming growth factor beta-1 (TGF-beta-1). It can be expressed in Escherichia coll transformants carrying a vector incorporating a chimeric gene (AAT16516) coding for the fusion. The TGF-beta- moiety increases efficacy of the body's normal soft tissue repair response and also induces osteogenesis. The collagen moiety provides an integral substratum or scaffolding for the TGF and cells involved in reconstruction and growth. The fusion protein provides sustained release and delivery of TGF-beta-1 to a target tissue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               297 GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  417 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               49 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97.0%; Score 1149; DB 2; Length 1171;
llarity 93.6%; Pred. No. 7e-67;
Conservative 0; Mismatches 2; Indels 12
                                                            1. 1057
/label= Collagen-IA
/note= "collagen IA alpha-helical domain"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                                                                                                                                                                          "human mature TFF-beta-1"
                                                                                                                                                            /note= "unidentified amino acid"
                                                                                                                             /note= "unidentified amino acid'
                                                                                                                                                                          1058. .1059.
/label= Linker_peptide
                                                ocation/Qualifiers
                                                                                                                                                                                                         1060. .1171
/label= TGF-beta-1
/note= "human matu:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Disclosure; Fig 6; 59pp; English
                                                                                                                                                                                                                                                                                                                                          95CA-02151547
                                                                                                                                                                                                                                                                                                                                                                       94US-00259263
                                                                                                                                                                                                                                                                                                                                                                                                        (USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                        Espino P;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 1996-140144/15.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 206; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 1171 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-PSDB; AAT16516
                                                                                                            Misc-difference
                                                                                                                                           Misc-difference
                                                                                                                                                                                                                                                                                                                                          12-JUN-1995;
                                                                                                                                                                                                                                                                                                                                                                         10-JUN-1994;
                                                                                                                                                                                                                                                                          CA2151547-A
                                                                                                                                                                                                                                                                                                           11-DEC-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                       Gruskin EA,
               Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         477
                                                                                                                                                                            Peptide
                                                Key
Domain
                                                                                                                                                                                                            Domain
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
```

```
The specification describes a method for producing an extracellular matrix protein or its fragment. The extracellular matrix protein is capable of self aggregating in a cell which does not ordinarily droxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by the cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the incorporating the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4hydroxyproline and 1. Controline to allow at least one of the amino acids to be assimilated into the cell and incorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4hydroxyproline into proteins. This is especially useful in the recombinant production of proteins such as collagen, fibrinogen and proteins depends on the post translational hydroxylation of proteins. The method is also useful in studying the structure and function of proteins depends on the post translational hydroxylation of proteins the present sequence represents chimeric collagen i (alphal/transforming growth factor-betal (TGF-betal) protein, which may be produced using the
                                                                                                                                             Extracellular matrix protein; self aggregation; hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation; ss. transforming growth factor-betal; TGF-betal; chimera.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        356
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPPGPAGEEGKRGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Production of extracellular matrix proteins containing 4-trans-
hydroxyproline results in native self aggregating proteins, useful on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPP-----GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ); DB 3; Length 1171; 7e-67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                           A chimeric collagen 1 (alphal)/TGF-betal protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Connolly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; Score 1149; DB
; Pred. No. 7e-67
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                        /note= "Gly encoded by GCT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Zhang G,
                                                                                                                                                                                                                                                                                                                    Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim 23; Fig 15; 260pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       99EP-00119184.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98US-00169768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             97.0%;
                                                                       25-JUL-2000 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gruskin EA, Buechter DD,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity 93.6;
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (USSU ) US SURGICAL CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     method of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 2000-259138/23.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    medical implants.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 1171 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N-PSDB; AAA12498.
                                                                                                                                                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                                                                                          Homo sapiens.
Unidentified.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   07-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         09-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                 12-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                             EP992586-A2
                                                                                                                                                                                                                                                                                Chimeric.
                                   AAY84538;
à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
```

108 416

8

Gaps

12;

476

RESULT 13 AAY84538

Page

us-10-658-989a-1.rag

```
GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 108
                                 357 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA 416
                                                                       GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPACKDGBAGAQGPPGPAGPAGERGEQGPA 168
                                                                                                         417 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This invention relates to novel nucleic acids and proteins present in normal and neoplastic pancreatic cells. Pancreatic cancer is a common cause of cancer death worldwide, therefore accurate methods of diagnosis and treatment are required. Compounds which modulate the proteins of the invention may have cytostatic activity and the protein and DNA sequences of the invention may be useful for the development of a vaccine or in gene therapy. The composition and methods are useful in diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer and non-cancerous disease states of the pancreas. The present sequence is that of a human pancreatic protein of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          New pancreatic specific nucleic acid molecule or protein for diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer conn-cancerous disease states of the pancreas.
                                                                                                                                                                                                                                                                                                                                                                                                                            neoplastic pancreatic cell; pancreatic cell; pancreatic cancer; cancer death; cytostatic; vaccine; gene therapy; non-cancerous pancreas disease; human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 97.0%; Score 1149; DB 7; Length 1211; Best Local Similarity 93.6%; Pred. No. 7.2e-67; Matches 206; Conservative 0; Mismatches 2; Indels 12;
                                                                                                                                                GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG
                                                                                                                                                                      GSPGFOGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARG
                                                                                                                                                                                                                                                                                                                                                                                            Human pancreatic cell protein sequence SegID517.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 12; SEQ ID NO 517; 635pp; English.
                                                                                                                                                                                                                                                                             ADE87057 standard; protein; 1211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19-DEC-2002; 2002WO-US040655.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21-DEC-2001; 2001US-0342768P.
                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (DIAD-) DIADEXUS INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 2003-587286/55.
N-PSDB; ADE87397.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 1211 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WO2003060145-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Liu C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Homo sapiens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24-JUL-2003.
                                                                                                                                                                                                                                                                                                                                                        29-JAN-2004
49
                                                                       109
                                                                                                                                                169
                                                                                                                                                                                  477
                                                                                                                                                                                                                                                                                                                   ADE87057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sun Y,
                                                                                                                                                                                                                                         RESULT 1.
                                                                                                                                                                                                                                                                                 g
                                                                     \stackrel{>}{\circ}
                                                                                                     qq
                                                                                                                                              ò
                                                                                                                                                                                유
```

g

ò

ö

1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA 48

```
ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This invention relates to novel nucleic acids and proteins present in normal and neoplastic pancreatic cells. Pancreatic cancer is a common cause of cancer death worldwide, therefore accurate methods of diagnosis and treatment are required. Compounds which modulate the proteins of the invention may have cytostatic activity and the protein and DNA sequences of the invention may be useful for the development of a vaccine or in gene therapy. The composition and methods are useful in diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer and non-cancercous disease states of the pancreas. The present sequence is that of a human pancreatic protein of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        New pancreatic specific nucleic acid molecule or protein for diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer or non-cancerous disease states of the pancreas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         517
                                                    109 GVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA 168
                                                                                   637
                     577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             518 GPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQA
                                                                            578 GVNGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 GPP------GEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPA
                                                                                                                                                                                                                                                                                                                                                                           neoplastic pancreatic cell; pancreatic cell; pancreatic cancer; cancer death; cytostatic; vaccine; gene therapy; non-cancerous pancreas disease; human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97.0%; Score 1149; DB 7; Length 1226; 93.6%; Pred. No. 7.2e-67; ive 0; Mismatches 2; Indels 12
                                                                                                                       169 GSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGPAG 208
                                                                                                                                                    638 GSPGFGGLPGPAGPPGBAGKPGEGGVPGDLGAPGPSGARG 677
                                                                                                                                                                                                                                                                                                                                                Human pancreatic cell protein sequence SeqID522.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 12; SEQ ID NO 522; 635pp; English.
                                                                                                                                                                                                                                           ADE87062 standard; protein; 1226 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19-DEC-2002; 2002WO-US040655.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        21-DEC-2001; 2001US-0342768P.
                                                                                                                                                                                                                                                                                                              (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best Local Similarity 93.6
Matches 206; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (DIAD-) DIADEXUS INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 2003-587286/55.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1226 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB; ADE87403.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO2003060145-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Liu C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens.
                                                                                                                                                                                                                                                                                                              29-JAN-2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   24-JUL-2003
                                                                                                                                                                                                                                                                             ADE87062;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sun Y,
                                                                                                                                                                                                            RESULT 15
                                                                                                                                                                                                                              ADE87062
                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                \overset{\sim}{\circ}
                                                                             셤
                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ઠે
```

169 GSPGFQGLPGPAGPPGBAGKPGBQGVPGDLGAPGPSGPAG 208 Search completed: September 24, 2004, 11:09:14 Job time : 31.5883 secs S G \$ A

GenCore version 5.1.6 Copyright (c) 1993 - 2004 Compugen Ltd.

Sequence 1, Appli

US-10-357-851-1

16

14.64

9.96

2966

16

LB-LO-000-0004-11.LADA

007 CC.CE.TT

September 24, 2004, 11:07:31; Search time 67.1873 Seconds (without alignments) 2603.588 Million cell updates/sec - protein search, using sw model OM protein Run on:

US-10-658-989A-4 3070 Title: Perfect score:

1 GSEGPEGVRGEPGPPGPAGA.......PGPSGDAGPPGPPGPAGKEG 544 Sequence:

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

1349238 segs, 321558718 residues Searched:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Total number of hits satisfying chosen parameters:

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

Published Applications AA:\*

1: /cgn2\_6/prodata/1/pubpaa/US07\_PUBCOMB.pep:\*
2: /cgn2\_6/prodata/1/pubpaa/PCT\_NEW\_PUB.pep:\*
3: /cgn2\_6/prodata/1/pubpaa/NCT\_NEW\_PUB.pep:\*
4: /cgn2\_6/prodata/1/pubpaa/US06\_PUBCOMB.pep:\*
5: /cgn2\_6/prodata/1/pubpaa/US07\_NEW\_PUB.pep:\*
6: /cgn2\_6/prodata/1/pubpaa/US08\_NEW\_PUB.pep:\*
7: /cgn2\_6/prodata/1/pubpaa/US08\_NEW\_PUB.pep:\*
8: /cgn2\_6/prodata/1/pubpaa/US08\_PUBCOMB.pep:\*
9: /cgn2\_6/prodata/1/pubpaa/US08\_PUBCOMB.pep:\*
10: /cgn2\_6/prodata/1/pubpaa/US09\_PUBCOMB.pep:\*
11: /cgn2\_6/prodata/1/pubpaa/US09\_PUBCOMB.pep:\*
11: /cgn2\_6/prodata/1/pubpaa/US09\_PUBCOMB.pep:\*
11: /cgn2\_6/prodata/1/pubpaa/US09\_PUBCOMB.pep:\*
12: /cgn2\_6/prodata/1/pubpaa/US10A\_PUBCOMB.pep:\*
13: /cgn2\_6/prodata/1/pubpaa/US10A\_PUBCOMB.pep:\*
14: /cgn2\_6/prodata/1/pubpaa/US10A\_PUBCOMB.pep:\*
15: /cgn2\_6/prodata/1/pubpaa/US10A\_PUBCOMB.pep:\*
16: /cgn2\_6/prodata/1/pubpaa/US10\_NEW\_PUB.pep:\*
17: /cgn2\_6/prodata/1/pubpaa/US10\_NEW\_PUB.pep:\*
18: /cgn2\_6/prodata/1/pubpaa/US10\_NEW\_PUB.pep:\*
18: /cgn2\_6/prodata/1/pubpaa/US60\_NEW\_PUB.pep:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

		Description	Sequence 16, Appl	Sequence 20, Appl	Sequence 11, Appl	Sequence 6, Appli	Sequence 8, Appli	Sequence 10, Appl	Sequence 25, Appl	Sequence 261, App	Sequence 159, App	Sequence 36, Appl	Sequence, 21, Appl	Sequence 2, Appli	Sequence 65, Appl	Sequence 28, Appl	Sequence 243, App
		QI	US-10-104-889-16	US-10-104-889-20	US-10-104-889-11	US-10-104-889-6	US-10-104-889-8	US-10-104-889-10	US-10-468-091-25	US-09-918-715-261	US-10-060-036-159	US-10-171-311-36	US-10-216-705-21	US-10-149-352-2	US-10-177-293-65	US-10-301-822-28	US-10-291-265-243
		8	16	16	16	16	16	16	16	12	14	14	74	14	14	4	12
	•	Length	1057	1057	1107	1169	1111	1388	1461	1464	1464	1464	1464	1464	1464	1464	1464
ф	Query	Match	96.6	96.6	9 96	96.6	96.6	96.6	9.96	96.6	96.6	96.6	9.96	96.6	9.96	96.6	96.6
		Score	2966	2966	2966	2966	2966	2966	2966	2966	2966	2966	2966	2966	2966	2966	2966
	Result	No.	П	7	m	4	2	9	7	80	თ	10	11	12	13	14	15
	<b>9</b> 40	Query	Result Query No. Score Match Length DB ID	Score Match Length DB ID 2966 96.6 1057 16 US-10-104-889-16	Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-20 2966 96.6 1057 16 US-10-104-889-20	Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 16, 2966 96.6 1107 16 US-10-104-889-11 Sequence 20, 2966 96.6 1107 16 US-10-104-889-11 Sequence 1.	Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-20 2966 96.6 1107 16 US-10-104-889-10 2966 96.6 1107 16 US-10-104-889-1 2966 96.6 1107 16 US-10-104-889-1 2966 96.6 1169 16 US-10-104-889-6 Sequence 17, Sequence 18, Se	Score Match Length DB ID Description 2966 96.6 1057 16 US-10-104-889-16 Sequence 16 2966 96.6 1057 16 US-10-104-889-16 Sequence 20 2966 96.6 1107 16 US-10-104-889-1 Sequence 21 2966 96.6 1169 16 US-10-104-889-6 Sequence 6, 2966 96.6 117 16 US-10-104-889-6 Sequence 6, 2966 96.6 171 16 US-10-104-889-9	Acore Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 16, 2966 96.6 1107 16 US-10-104-889-11 Sequence 11, 2966 96.6 1107 16 US-10-104-889-11 Sequence 11, 2966 96.6 1169 16 US-10-104-889-6 Sequence 6, 2966 96.6 1171 16 US-10-104-889-8 Sequence 8, 2966 96.6 1381 16 US-10-104-889-10 Sequence 19, 2966 96.6 1381 16 US-10-104-889-10 Sequence 10, 2966 96.	Cuery Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 2966 96.6 1057 16 US-10-104-889-20 2966 96.6 1057 16 US-10-104-889-1 2966 96.6 1169 16 US-10-104-889-8 2966 96.6 1171 16 US-10-104-889-8 2966 96.6 1389 16 US-10-104-889-8 2966 96.6 1389 16 US-10-104-889-10 2966 96.6 1389 16 US-10-104-889-10 Sequence 10 2966 96.6 1489 16 US-10-104-889-10 Sequence 10 2966 96.6 1489 16 US-10-104-889-10 Sequence 20	Score Match Length DB ID Description  2966 96.6 1057 16 US-10-104-889-16 Sequence 16 2966 96.6 1057 16 US-10-104-889-16 Sequence 20 2966 96.6 1169 16 US-10-104-889-6 Sequence 11 2966 96.6 1169 16 US-10-104-889-6 Sequence 8, 2966 96.6 1189 16 US-10-104-889-9 Sequence 8, 2966 96.6 1388 16 US-10-104-889-10 Sequence 25 2966 96.6 1461 16 US-10-104-889-10 Sequence 25 2966 96.6 1461 12 US-10-104-889-12 Sequence 25	Acore Match Length DB ID  Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 16 2966 96.6 1107 16 US-10-104-889-1 Sequence 17 2966 96.6 1169 16 US-10-104-889-6 Sequence 17 2966 96.6 1169 16 US-10-104-889-6 Sequence 17 2966 96.6 1169 16 US-10-104-889-8 Sequence 18 2966 96.6 1461 16 US-10-104-889-1 Sequence 25 2966 96.6 1461 16 US-10-104-889-1 Sequence 25 2966 96.6 1461 12 US-09-18-715-261 Sequence 25 2966 96.6 1464 12 US-09-18-715-261 Sequence 25	Query Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 16 2966 96.6 1057 16 US-10-104-889-16 Sequence 20 2966 96.6 1107 16 US-10-104-889-18 Sequence 20 2966 96.6 1171 16 US-10-104-889-8 Sequence 6, 2966 96.6 1171 16 US-10-104-889-8 Sequence 20 2966 96.6 1461 16 US-10-104-889-10 Sequence 25 2966 96.6 1461 16 US-10-468-091-25 Sequence 25 2966 96.6 1464 14 US-10-060-036-159 Sequence 25	Acore Match Length DB ID  Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 16 2966 96.6 1107 16 US-10-104-889-1 Sequence 16 2966 96.6 1107 16 US-10-104-889-1 Sequence 17 2966 96.6 1189 16 US-10-104-889-1 Sequence 17 2966 96.6 1189 16 US-10-104-889-1 Sequence 17 2966 96.6 1461 12 US-10-104-889-1 Sequence 25 2966 96.6 1461 12 US-10-104-889-1 Sequence 25 2966 96.6 1464 14 US-10-060-036-159 Sequence 15 2966 96.6 1464 14 US-10-11-316 Sequence 36 2966 96.6 1464 14 US-10-216-705-21	Query Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 10 2966 96.6 1169 16 US-10-104-889-16 Sequence 20 2966 96.6 1169 16 US-10-104-889-1 Sequence 20 2966 96.6 1169 16 US-10-104-889-6 Sequence 20 2966 96.6 1169 16 US-10-104-889-6 Sequence 20 2966 96.6 1464 12 US-10-104-889-1 Sequence 20 2966 96.6 1464 14 US-10-060-036-125 Sequence 25 2966 96.6 1464 14 US-10-060-036-126 Sequence 25 2966 96.6 1464 14 US-10-216-738-136 Sequence 25 2966 96.6 1464 14 US-10-216-738-136 Sequence 25 2966 96.6 1464 14 US-10-216-738-139 Sequence 27 2966 96.6 1464 14 US-10-216-738-139 Sequence 27 2966 96.6 1464 14 US-10-216-738-22 Sequence 27 2966 96.6 1464 14 US-10-216-738-22 Sequence 27	Query Score Match DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 16 2966 96.6 1057 16 US-10-104-889-16 Sequence 10 2966 96.6 1107 16 US-10-104-889-16 Sequence 20 2966 96.6 1107 16 US-10-104-889-16 Sequence 20 2966 96.6 1171 16 US-10-104-889-8 Sequence 6, 2966 96.6 1171 16 US-10-104-889-8 Sequence 25 2966 96.6 1461 16 US-10-104-889-10 Sequence 25 2966 96.6 1464 14 US-10-104-889-10 Sequence 25 2966 96.6 1464 14 US-10-17-311-36 Sequence 36 2966 96.6 1464 14 US-10-17-311-36 Sequence 27 2966 96.6 1464 14 US-10-17-3131-36 Sequence 27 2966 96.6 1464 14 US-10-17-331-35 Sequence 27 2966 96.6 1464 14 US-10-17-331-36 Sequence 27 2966 96.6 1464 14 US-10-17-333-65 Sequence 27	Query Score Match Length DB ID  2966 96.6 1057 16 US-10-104-889-16 Sequence 16 2966 96.6 1107 16 US-10-104-889-1 Sequence 25 2966 96.6 1107 16 US-10-104-889-1 Sequence 17 2966 96.6 1189 16 US-10-104-889-1 Sequence 17 2966 96.6 1189 16 US-10-104-889-1 Sequence 25 2966 96.6 1189 16 US-10-104-889-1 Sequence 25 2966 96.6 1461 12 US-10-104-889-1 Sequence 25 2966 96.6 1464 14 US-10-71-311-36 Sequence 36 2966 96.6 1464 14 US-10-71-311-36 Sequence 25 2966 96.6 1464 14 US-10-71-311-36 Sequence 25 2966 96.6 1464 14 US-10-11-313-26 2966 96.6 1464 14 US-10-11-33-365 Sequence 65 2966 96.6 1464 14 US-10-11-233-65 Sequence 65 2966 96.6 1464 14 US-10-11-233-65 Sequence 65 2966 96.6 1464 14 US-10-17-293-65 Sequence 65

	٦,	79,	7	7	49,	26,	æ	80	-	10,	Ļ	20,	5,	e 48,	ý	e 48,	s 50,	e 22,	33,	12,	12,	10,	10,	70,	35,	e 74,	22,	23,	4
	Seguend	Seguenc	Segueno	Sequence	Seguence	Seguenc	Sequenc	Sequenc	Sequence	Sequenc	Sequence	Sequence	Sequence	Seguenc	Sequence	Seguence	Sequence	Sequence	Sequence	Sequenc	Sequence	Seguence	Sequence	Sequence	Seguenc	Seguenc	Seguenc	Sequence	Creamen
	-10-358-024-1	-10-734-56	-10-402-08	-10-402-0	-10-342-331-4	-10-468-05	-10-402-0	-10-402-07	-10-058-124-1	-10 - 63	-10-194-441A-	-10-058-12	-10-468-	-10-194-	-10-46	-10-342-331-4	-10-342-331-5	-10-232-175-	-10 - 232 - 175 - 3	-10-402-089-1	-10-402	-10-402	-10-402-072A-	-10-177-293-7	-10-301	-10-236-031B-	-10-468-091-	-10-468-091-2	00000
. ,		Þ	ß					S	14 US	16 US				14 US		15 US					15 US				Þ		16 US	16 US	
	46	1464	46	1463	822	1453	1449	1449	34	1017	2	1418	1418	1014	48	595	595	200	662	1466	1466	36	1366	49	1496	1496	1496	1497	
					93.1				6.06	72.5			71.7	71.3			70.2		9.99		62.7		62.6		-	-		62.2	
	σ	σ	σ	2936	æ	æ	816	ø	2791.5	N	$^{\circ}$	$^{\circ}$	a	-	~	⊣	ч	0	0	4	924	92	13	921.	N	921.	921	9	1
	17	18	13	20	21				25									34	35	36	37	38	ტ ტ	40	41	42	43	44	

## ALIGNMENTS

RESULT 1

US-10-104-899-16

US-10-104-899-16

Sequence 16, Application US/10104899

Publication No. US20040086561A1

GENERAL INFORMATION:

BUECHTER, DOUGLAS

BROKAM, JANE

BROKESSES

CORRESSENDENCES: 50

CORRESSENDENCES IS DIMORTH & BARRESE

STREET: 333 BARLE OVINGTON BOULEVARD

STREET: NY

COUNTRY: U.S.A.

ZIP: 11553

COMPUTER: BRADABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: BRADABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: BRADABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: BRADABLE FORM:

MEDIUM TYPE: Ploppy disk

COMPUTER: BRADABLE FORM:

MEDIUM TYPE: PC-DOS/MS-DOS

SOFTWARE: PATENTON DATA:

APPLICATION DATA:

PRIOR APPLICATION NUMBER: US/10/104, 889

FILING DATE: 22-MAr-2002

CLASSIFICATION NUMBER: US/09/169, 768

FILING DATE: 09-OCT-1998

ATTORNEY/AGENT INFORMATION:

MAMS: STEEN, USFORMINGNEMINON:

TELECOMMUNICATION INFORMATION:

MANS: STEEN INFORMATION:

TELEPHONE: (516) 228-8484

TELEPHONE: (516) 228-8484

TELEPHONE: (516) 228-8816

INFORMATION FOR SEQ ID NO: 16:

SEQUENCE CHARACTERISTICS:

Sep 24 11:45:39 2004

Fr.

```
120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 09
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 GPGGPPGPRGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPPGAVGPAGKDGEAGAOGPPGPAGPAGBAGERGEOGPAGSPGFAGRPGEO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            561 GAPGLQCMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481 GPAGPAGPPGBIGDVGAPGAKGARGSAGPPGATGPPGAAGRVGPPGPGGAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181 GSPGSPGPDGKTGPPGPPGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <u>GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 1057
           CORDUTE: IN TALES WITH A COMPUTATION OF SYSTEM: PC COMPUTATION SYSTEM: PC COMPATIBLE OF SYSTEM: PC COMPATIBLE OF SYSTEM: PC COMPATIBLE OF SYSTEM: PC COMPATIBLE OF SYSTEM: PC COMPATION NUMBER: US/10/104,889
FILING DATE: 22 AMINOWN>
PRIOR APPLICATION NUMBER: US/02/104,889
FILING DATE: 20 AURNOWN>
PRIOR APPLICATION NUMBER: US/09/169,768
ATTORNEY/AGENT INFORMATION:
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
96.6%; Score 2966; DB 16;
Best Local Similarity 95.6%; Pred. No. 4.9e-146;
Matches 520; Conservative 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: unknown
MOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO: 20:
                                                                                                                                                                                                                                                                                                                                                                                     TELEPHONE: (516) 228-8484
TELEFAX: (516) 228-8516
                                                                                                                                                                                                                                                                                                                                                                                                                                       INFORMATION FOR SEQ ID NO: 20:
SEQUENCE CHARACTERISTICS:
LENGTH: 1057 amino acids
                                                                                                                                                                                                                                                                                                                                  NAME: STEEN, JEFFREY S
TELECOMMUNICATION INFORMATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-10-104-889-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 3
US-10-104-889-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    쉽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                               ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                   GEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP 320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GAPGLQGMPGERGAAGLPGPKGDAGPKGADGSPGKDGVRGLIGPIGPPGPAGAPGDK 620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  681 GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA 740
                                                                                                                                                                                                                                                                                                                                  1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GS PGS PGPDGKTGPPGPAGQDGRPGPPGPAGQAGWGFPGPKGAAGEPGKAAGEVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAAAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGFPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                               ö
                                                                                                                                                                                                                   Length 1057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RESULT 2
US-10-104-889-20
is Sequence 20, Application US/10104889
is Publication No. US20040086961A1
is GENERAL INFORMATION:
    APPLICANT GRUSKIN, ELLIOT A.
    BROKAW, JANE
    TITLE OF INVENTION: ANINO ACID MODIFIED POLYPEPTIDES
    NUMBER OF SEQUENCES: SO
    CORRESPONDENCES: SO
    CORRESPONDENCES: DILMORTH & BARRESE
    STREET: 333 EARLE OVINGTON BOULEVARD
    CORRESPONDENCES: SO
    CORRESPONDENCE ADDRESS:
    C
                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                   96.6%; Score 2966; DB 16; 95.6%; Pred. No. 4.9e-146; tive 21; Mismatches 3;
                    TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: unknown
MOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO: 16:
US-10-104-889-16
JENGTH: 1057 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                    Best Local Similarity 95.6%
Matches 520; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY: U.S.A. ZIP: 11553
                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKEG 744
                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              541
                                                                                                                                                                                                                         Query Match
```

g

ò 유 ò g ଧ g à

ò 셤 ò Op ò Ωp ò 셤 ò

ö

```
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/09/169,768
FILING DATE: 09-OCT-1998
ATTORNEY/AGENT INFORMATION:
NAME: STEEN, JEFFREY S
TELECOMMUNICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRANDEDURES: single
STRANDEDURES: single
TOPOLOGY: unknown
NOLECULE TYPE: peptide
SEQUENCE DESCRIPTION: SEQ ID NO: 6:
US-10-104-889-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEPHONE: (516) 228-8484
TELEFAX: (516) 228-8516
INFORWATION FOR SEQ ID NO: 6:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                 741 GXEG 744
                                                                                                                                                                                                                                  541 GKEG 544
                                                                                                                                                                                                                                                                                                                                     RESULT 4
US-10-104-889-6
                            561
                                                                  421
                                                                                                                                                   481
                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                   엄
                                                                                                                                                 ò
                                                                                                                                                                                                                                ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    201 GSEGPQCVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIACAPGFPGARGPSGPQ 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP 320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           321 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGSPGRDGKTGPPGPAGQDGRPGPPGPRGAAGQAGVMGFPGFKGAAGEPGKKAAGVVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       501 GVPGDLGAPGPSGARGERGFPGERGVGGPPGPAGPRGANGAPGNDGARGDAGAPGAPGSO 560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1107;
Sequence 11, Application US/10104889
Publication No. US20040086961A1
GENERAL INFORMATION:
APPLICANT: GRUSKIN, ELLIOT A.
BUECHTER, DOUGLAS
BUECKAN, JANE
ZHANG, GUANGHUI
PAOLELLA, DAVID
TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
NUMBER OF SEQUENCES: 50
CORRESPONDENCE ADDRESS:
CORRESPONDENCE BURNESE
STREET: 333 BARLE OVINGTON BOULEVARD
                                                                                                                                                                                                                                                                                   STATE: UNIVERSELY

COUNTRY: U.S.A.

ZIP: 11553

COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: TEM PC compatible

COMPUTER: TEM PC compatible

COMPUTER: TEM PC compatible

COMPUTER: TEM PC compatible

COMPUTER: Patentin Release #1.0, Version #1.30

CURRENT APPLICATION NUMBER: US/10/104,889

FILING DATE: 22-Mar-2002

CLASSIFICATION NUMBER: US/09/169,768

FILING DATE: 090-CT-1998

ATTORNEY/AGENT INFORMATION:

NAME: STEEN, USFPREY S

TELEPAR: (1516) 228-8484

TELEPAR: (1516) 228-8484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match 96.6%; Score 2966; DB 16;
Best Local Similarity 95.6%; Pred. No. 5.1e-146;
Matches 520; Conservative 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: amino acids
STRANDEDNESS: single
STRANDEDNESS: single
TOPOLOGY: unknown
MOLECULE TYPE: peptide
SEQUENCE: DESCRIPTION: SEQ ID NO: 11:
US-10-104-889-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     INFORMATION FOR SEQ ID NO: 11:
SEQUENCE: CHARACTERISTICS:
LENGTH: 1107 amino acids
                                                                                                                                                                                                                                                                          CITY: UNIONDALE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
```

GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420

```
ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  201 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGFTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKKGARGEPGPTGLP 320
                                                                                                                                                                                                     9
1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         0; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-10-104889

Publication No. US20040086961A1

GENERAL INPORATION:

BUCKTER, DOUGLAS

BROKAN JAME

ZHANG, GUANGHUI

PAOLELLA, DAVID

TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES

NUMBER OF SEQUENCES: 50

CORRESPONDENCE ADDRESS:

ADDRESSEE: DILWORTH & BARRESE

STREET: 333 EARLE COINGTON BOULEVARD

CITY: UNIONDALE

STATE: NY

COUNTRY: U.S.A.

ZIP: 11553

COMPUTER: READABLE FORM:

MEDIUM TYPE: Ploppy disk

COMPUTER: BMP PC compatible

OPERATING SYSTEM: PC-DOS/MS-DOS

SOFTWARE: BAREATION RELEGATION DATA:

APPLICATION NUMBER: 127-Mar-2002

CURRENT APPLICATION NUMBER: 127-Mar-2005

SOFTWARE: PARTE 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

FILING DATE: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

FILING DATE: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

FILING DATE: 22-Mar-2005

FILING DATE: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

FILING DATE: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

FILING DATE: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

CLASSIFICATION NUMBER: 22-Mar-2005

CLASSIFICATION NUMBER: AUDION CURROND NUMBER: 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match 96.6%; Score 2966; DB 16; Best Local Similarity 95.6%; Pred. No. 5.3e-146; Matches 520; Conservative 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
```

ö

260

09

120 320 180 380

240

440

360 560 420 620 680

```
241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  501 GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ
                                                                                                                                                                                                                 201 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ
                                                                                                                                                                                                                                                                                           261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                    GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                       61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                         GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                              GPPGERGGPGSRGFPGADGVAGPRGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                              ..
0
                                                                                                            Length 1171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        BROKAN, JANE
EROKAN, JANE
ZHANG, GUANGHUI
PACLELLA, DAVID
TILE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
NUMBER OF SEQUENCES: 50
CORRESPONDENCE ADDRESS:
                                                                                                                                              Indels
                                                                                                          96.6%; Score 2966; DB 16; 95.6%; Pred. No. 5.4e-146; iive 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE: DILMORTH & BARRESE
STREET: 333 EARLE OVINGTON BOULEVARD
CITY: UNIONDALE
STRANDEDNESS: single
TOPOLOGY: unknown
MOLECULE TYPE: peptide
US-10-104-889-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 6
US-10-104-889-10
; Sequence 10, Application US/10104889
; Publication No. US20040086961A1
; GENERAL INFORMATION:
APPLICANT: GRUSKIN, ELLIOT A.
BUECHTER, DOUGLAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ZIP: 11553
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COUNTRY: U.S.A.
                                                                                                                             Local Similarity
es 520; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKEG 744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKEG
                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                    381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        741
                                                                                                                               Best Loca
Matches
                                                                                                                                                                                   ò
                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                        엄
                                                                                                                                                                                                                                                                                                                            \delta
                                                                                                                                                                                                                                                                                                                                                            q
                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \stackrel{\diamond}{\circ}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                          240
                                                                                                                                              300
                                        380
                                                                                                            440
                                                                                                                                                                 441 GPPGAVGPAGKDGEAGAQGPPGPAGPAGEAGEQGPAGSPGFQGLPCPAGPPGEAGKPGEO 500
                                                                                                                                                                                                                                          620
                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                    680
                                                                                                                                                                                                                                                                                                                                                                                                                                        540
                                                                                                                                                                                                                                                                                                                                                                                                                                                         681 GPAGPAGPFGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPG 740
   GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                   301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                           GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                    561 GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPFGPPGPAGAPGDK
                            GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                          GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                621 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                      GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 8, Application US/10104889
| Publication No. US20040086961A1
| GENERAL INFORMATION:
| APPLICANT: GRUSKIN, ELLIOT A. BROKAM, JAME
| ENCRAM, JAME
| ENCRAM, JAME
| PAOLELIA, DAVID
| TITLE OF INVENTION: AMINO ACID MODIFIED POLYPEPTIDES
| NUMBER OF SEQUENCES: 50
| CORRESPONDENCE ADDRESS:
| ADDRESSEE: DILWORTH & BARRESE
| STREET: 333 EARLE OVINGTON BOULEVARD
| CITY: UNIONDALE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
MEDIUM TYPE: Rloppy disk
COMFUTER: IBM FC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Ver
CURRENT APPLICATION DATA:
FILING DATE: 22-Mar-2002
CLASSIFICATION: «Unknown»
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICATION UNMER: US/09/169,768
FILING DATE: 09-007-1998
ATTORNEY/AGENT INFORMATION:
NAME: STEEN, JEFFREX S
TELECOMMUTCATION INFORMATION:
TELEPHONE: (516) 228-8484
TELEPHONE: (516) 228-8484
IELEPHONE: (516) 228-816
INFORMATION FOR SEQ ID NO: 8:
SEQUENCE CHARACTERISTICS:
LENGTH: 1171 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY: U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STATE: NY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKEG 744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 5
US-10-104-889-8
   121
                                                                          181
                                                                                                                                              241
                                                                                                                                                                                                                                                       501
                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                            g
                                                                        8 6
                                                                                                                                   ò
                                                                                                                                                                     d
                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                        \delta
                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
```

```
## Publication No. US20040157329A1
| JARDRAL INFORMATION:
| APPLICANT: ADP Pharmaceutical Pry Limited
| APPLICANT: The University of Sydney
| TITLE OF INVENTION: Marrix gene expression in chondrogenesis
| FILE REFERENCE: 500311 |
| CUTRENT PILIOS DATE: 2003-08-13 |
| PRIOR APPLICATION NUMBER: AU PR3116 |
| PRIOR APPLICATION 
                                                                                                                                                                                                                                                                                                                                                                 TYPE: PRT
CORGANISM: Homo sapiens
US-10-468-091-25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 899 GKEG 902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-918-715-261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGESGKRGARGEPGPTGLP. 320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   201 GSEGPOGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGKTGPPCPAGODGRPGPPGARGOAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity 95.6%; Pred. No. 6.1e-146;
Matches 520; Conservative 21; Mismatches 3; Indels 0;
     COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/10/104,889
FILING DATE: 22-Mar-2002
CLASSIFICATION: <UNKNOWN>
                                                                                                                                                                        PRIOR APPLICATION: CALLANDER:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/09/169,768
FILING DATE: 09-COT-1998
ATTORNAY AGENT INFORMATION:
NAME: STEEN, JEFFREY S
TELECOMMUNICATION INFORMATION:
TELEPRONE: (516) 228-9484
TELEFAX: (516) 228-9516
INFORMATION FOR SEQ ID NO: 10:
SEQUENCE TRARACTERISTICS:
LENGTH: 1388 amino acids
TYPE: amino acid
STYPE: amino acid
STYPE: amino acids
TYPE: amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TOPOLOGY: unknown

MOLECULE TYPE: peptide

SEQUENCE DESCRIPTION: SEQ ID NO: 10:
US-10-104-889-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 7
US-10-468-091-25
; Sequence 25, Application US/10468091
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ĠĸĖĠ 744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               a
a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    868
                                                                                                                                                                                                                          478
                                                                                                                                                                                                                                                                     180
                                                                                                                                                                                                                                                                                                               538
                                                                                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                   418
                                                                                                                                                                              120
                                                                                                                                                                                                                                                                                                                                                                                                    598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      778
                                                                                         9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            359 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ
                                                                                                                                                                                                                                                                                                                                                                                 241 GPPGAVGPAGKDGBAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        599 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           779 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481 GPAGPAGPPGFIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPAFA
                                                                                                                                                                                GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                 419 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKKGARGEPGPTGLP
                                                                                                                                                                                                                                                                     GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                              479 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGFAGRPGEAGRPGEAGLPGAKGLT
                                                                                           1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                            GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                            Gaps
                                            ;
0
Query Match 96.6%; Score 2966; DB 16; Length 1461; Best Local Similarity 95.6%; Pred. No. 6.4e-146; Matches 520; Conservative 21; Mismatches 3; Indels 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 261, Application US/09918715
Publication No. US20030017157A1
GENERAL INFORMATION:
APPLICANT: Bard St. Croix
APPLICANT: Bert Vogelstein
APPLICANT: Kenneth Kinzler
TITLE OF INFORMATION: ENDOTHELIAL CELL EXPRESSION PATTERNS
FILE REFERENCE: 1107.00134
```

ö

Gaps

421

60

481 180

300 601

360

721

480

```
602 GPPGAVGPAGKDGEAGAGGPPGPAGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      782 GESGPSGPAGPIGARGAPGDRGEPGPPGPAGFAGFAGPAGPGADGQPGAKGEPGDAGAKGDAGPP 841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      722 GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 36, Application US/10171311
Sequence 36, Mornage 10 US20030087270A1
GENERAL INFORMATION:
APPLICANT: Schlegel, Robert
APPLICANT: Chen, Yan
APPLICANT: Chen, Yan
APPLICANT: Kamatkar, John
APPLICANT: Kamatkar, Shubhangi
APPLICANT: Gannavarapu, Manjula
APPLICANT: Generak, Sebastian
APPLICANT: Hoersh, Sebastian
APPLICANT: IDENTIFICATION, ASSESSMENT, PREVENTION, AND THERAPY
TITLE OF INVENTION: OF CERVICAL CANCER
                                                                                                                                                                                                                                                                                                                                                  422 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                           1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPPCAVGPACKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                      61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            482 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLDPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                      ;
0
                                                                                                                                                                                                                                                 Length 1464;
                                                                                                                                                                                                                                                                                      Indels
            AND DIAGNOSIS OF PANCREATIC CANCER
                                                                                                                                                                                                                                            Query Match 96.6%; Score 2966; DB 14; Best Local Similarity 95.6%; Pred. No. 6.4e-146; Matches 520; Conservative 21; Mismatches 3;
                      FILE REFERENCE: 210121.56
CURRENT APPLICATION NUMBER: US/10/060,036
CURRENT FILING DATE: 2002-01-30
NUMBER OF SEQ ID NOS: 4560
SOFTWARE: EstSEQ for Windows Version 4.0
SEQ ID NO 159
LENGTH: 1464
                                                                                                                                                                                  ; ORGANISM: Homo sapiens
US-10-060-036-159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKEG 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 10
JS-10-171-311-36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             902
                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                             쉱
                                                                                                                                                                                                                                                                                                                                                                                                      ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                               ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                           GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVPCDLGAPGPSGARGEPGFPGERGVEGPPGPPGAPGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPG 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           901
                                                                                                                                                                                                                                                                                                                                                                                                      09
                                                                                                                                                                                                                                                                                                                                                                                                  1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GVPGDLGAPGPSGARGERGFPGERGVQGPPGPRGPRGAPGNDGAKGDAGAPGAPGSO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAPGLQGWPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            842 GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                               ö
                                                                                                                                                                                                                                                                                                                           Length 1464;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 9
US-10-060-036-159
US-10-060-036-159
Sequence 159, Application US/10060036
Publication No. US20030073144A1
GENERAL INFORMATION:
APPLICANT: Renson, Darin R.
APPLICANT: Lodes, Michael D.
APPLICANT: Persing, David H.
APPLICANT: Hepler, William T.
APPLICANT: Hepley, Yuqiu
APPLICANT: Jiang, Yuqiu
IIILE OF INVENTION: COMPOSITIONS AND METHODS FOR THE THERAPY
                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                         DB 12;
                                                                                                                                                                                                                                                                                                                       96.6%; Score 2966; DB 12;
95.6%; Pred. No. 6.4e-146;
tive 21; Mismatches 3;
CURRENT APPLICATION NUMBER: US/09/918,715
CURRENT FILING DATE: 2001-08-01
FRIOR APPLICATION NUMBER: 60/225,599
PRIOR APPLICATION NUMBER: 60/224,360
PRIOR PELING DATE: 2000-08-01
PRIOR PELING DATE: 2000-08-11
PRIOR FILING DATE: 2000-08-11
PRIOR FILING DATE: 2000-04-11
SPRIOR FILING DATE: 2000-04-11
SEQ ID NOS: 358
SOFTWARE: FREESEQ FOR Windows Version 3.0
TYBE: PRT
                                                                                                                                                                                                                                                                                                                   Query Match
Best Local Similarity 95.6%
Matches 520; Conservative
                                                                                                                                                                                                                                                           ; ORGANISM: Homo sapiens
US-09-918-715-261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      902 GKEG 905
                                                                                                                                                                                                                                                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 722
                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          д
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 요
```

Sep

Fri

```
GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPPGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPA 540
                                                                                                                                                                                                                                                                                                            GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                  362 GSEGPPGGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    542 GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAPGLQGMPGERGAAGLPCPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPPGERGGPGSRGFPGADGVAGPRGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                             482 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                         1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                              GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                        ö
                                                                                                                                                                         Length
                                                                                                                                                                                                        Indels
                                                                                                                                                                        96.6%; Score 2966; DB 14;
95.6%; Pred. No. 6.4e-146;
ive 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 12
US-10-149-352-2
Sequence 2, Application US/10149352
Publication No. US20030105050A1
GENERAL INFORMATION:
APPLICANT: Berl, Rajinder
TITLE OF INVENTION: ANTIBENSE CLIGONUCLEOTIDES
FILE REFERENCE: 06275-254U31
CURRENT APPLICATION NUMBER: US/10/149,352
CURRENT FILING DATE: 2002-06-10
PRIOR FILING DATE: 2002-06-10
PRIOR FILING DATE: 2000-12-12
PRIOR FILING DATE: 1999-12-15
NUMBER OF SEQ ID NOS: 14
SEQ ID NO 2
SEQ ID NO 2
LENGTH: 1464
     09/331,347
PRIOR APPLICATION NUMBER: US 09/
NUMBER OF SEQ ID NOS: 22
NUMBER: Patentin version 3.1
SEQ ID NO 21
LENGTH: 1464
TYPE: PRT
CAGANISM: Homo sapiens
US-10-216-705-21
                                                                                                                                                                                                          Conservative
                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541 GKEG 544
                                                                                                                                                                         Query Match
Best Local Simi
Matches 520;
                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              481
                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                            엄
                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                             엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                   ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Derived Proteins Produced by Plants,
Uses
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 421
                                                                                                                                                                                                                                                                                                                                                                                                                                 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           542 GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGWGPPGPKGAAGEPGKAGERGVP 601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPPGAVGPAGKDGEAGAQGPPGPAGPAGPRGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   782. GESGPSGPAGPTGAKGAPGDRGEPGPPGPAGPAGPAGPDGQPGAKGEPGDAGAKGDAGPP 841
                                                                                                                                                                                                                                                                                                                                                                09
                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKKGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSEGPEGVRGEPGPPGPAGAGGPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPCAVGPACKDGEACAEGPPCPACPAGERGEEGPACSPCFECTPGPAGPPGEACKPCEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                 Length 1464;
                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                             96.6%; Score 2966; DB 14;
95.6%; Pred. No. 6.4e-146;
tive 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 21, Application US/10216705
Publication No. US20030096973A1
GENERAL INFORMATION:
APPLICATION Meristem Therapeutics, S.A.
TITLE OF INVENTION: Recombinant Collagens and ITILE OF INVENTION: obtaining Such and Their IFILE REPERENCE: 1149-3 DIV
CURRENT APPLICATION NUMBER: US/10/216,705
CURRENT FILING DATE: 2002-08-09
 CURRENT APPLICATION NUMBER: US/10/171,311
CURRENT APPLICATION NUMBER: US/00/171,311
PRIOR APPLICATION NUMBER: US 60/298,159
PRIOR FILING DATE: 2001-06-13
PRIOR FILING DATE: 2001-06-13
PRIOR FILING DATE: 2001-06-13
PRIOR FILING DATE: 2001-06-13
PRIOR PILING DATE: 2001-11-14
NUMBER OF SEQ ID NOS: 238
SOFTWARE: FASESEQ for Windows Version 4.0
SED ID NOS: 58 ED IN 1464
                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity 95.6
Matches 520; Conservative
                                                                                                                                                                                                                            TYPE: PRT
, ORGANISM: Homo sapiens
US-10-171-311-36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKEG 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 11
US-10-216-705-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                  362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                722
                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    දු පු
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8 & 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                   8 8
```

180

481

421

9

541

601 300 661

721 420 781 480 841

```
61 -GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            602 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP 841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVPGDLGAPGPSGARGEPGFFGERGVEGPPGPPGAPGAPGAPGDDGARGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  542 GSPGSPGPDGKIGPPGPAGQDGRPGPPGPPGPRGQARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSEGPEGVRGEPGPPGPAGAGGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            482 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSPGSPGFDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 1464;
    PREVENTION, AND THERAPY OF BREAST CANCER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 96.6%; Score 2966; DB 14;
Best Local Similarity 95.6%; Pred. No. 6.4e-146;
Matches 520; Conservative 21; Mismatches 3;
                   FILE REFERENCE: MRI-038

CURRENT APPLICATION NUMBER: US/10/177,293

CURRENT FILING DATE: 2002-06-21

PRIOR APPLICATION NUMBER: US 60/299,887

PRIOR FILING DATE: 2001-06-27

PRIOR FILING DATE: 2001-06-27

PRIOR FILING DATE: 2001-06-27

PRIOR PILING DATE: 2001-06-27

PRIOR PILING DATE: 2001-09-25

PRIOR PILING DATE: 2001-09-25

PRIOR FILING DATE: 2001-09-25

PRIOR FILING DATE: 2002-09-05

PRIOR FILING DATE: 2002-05-05

PRIOR FILING DATE: 2002-05-14

NUMBER OF SEQ ID NOS: 506

SEQ ID NO 55

SEQ ID NO 55

SEQ ID NO 55

PRIOR FILING DATE: 2002-05-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 28, Application US/10301822; Publication No. US20030148410A1
                                                                                                                                                                                                                                                                                                                                                                                                                                  ; ORGANISM: Homo sapiens
US-10-177-293-65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GKEG
                                                                                                                                                                                                                                                                                                                                                                                           LENGTH: 1464
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULT 14
US-10-301-822-28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \dot{\delta}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: SAhin, Aysegul
APPLICANT: Mills, Gordon B.
TITLE OF INVENTION: COMPOSITIONS, KITS, AND METHODS FOR IDENTIFICATION, ASSESSMENT,
                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            540
                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                             GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                             542 GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGPPGPKGAAGEPGKAGEKGVP 601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDACAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA 901
                                                                                                                                                                      9
                                                                                                                                                                 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                         GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                       GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                             Gaps
                                                                                                                           ô
                                                                                      Length 1464;
                                                                                                                           Indels
                                                                             Ouery Match 96.6%; Score 2966; DB 14;
Best Local Similarity 95.6%; Pred. No. 6.4e-146;
Matches 520; Conservative 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 65, Application US/10177293
Publication No. US20030124128A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Wang, Youzhen
Xu, Yongyao
Hoersch, Sebastian
Monahan, John
Meyers, Rachel E.
Bast Jr., Robert C.
Hortobagyi, Gabriel N
Pusztai, Lajos
Meric, Funda
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gannavarpu, Manjula
Kamatkar, Shubhangi
Mertens, Maureen
Myer, Vic
Wang, Youzhen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Lillie, James
APPLICANT: Clatt, Karen
APPLICANT: Zhao, Xumei
APPLICANT: Gannavarpu, Mar
APPLICANT: Kamatkar, Shubh
APPLICANT: Mertens, Mauree
APPLICANT: Mertens, Mauree
APPLICANT: Wang, Youzhen
APPLICANT: Wang, Yongyao
APPLICANT: Hoersch, Sebast
APPLICANT: Hoersch, Sebast
APPLICANT: Monahan, John
; TYPE: PRT
; ORGANISM: Homo sapiens
US-10-149-352-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKEG 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-10-177-293-65
                                                                                                                                                                                                        362
                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                      482
                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                               à
                                                                                                                                                                                             d
                                                                                                                                                                                                                                         ठे
                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              엄
```

ö

421

9

481

541 240 601

480

901

```
Best Local Similarity 95.6
Matches 520; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
CORGANISM: Homo sapiens
US-10-291-265-243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Dp.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
       APPLICANT: Millennium Pharmaceuticals, Inc.
APPLICANT: Millennium Pharmaceuticals, Inc.
APPLICANT: Millennium Pharmaceuticals, Inc.
APPLICANT: Guillemetter, Tracy L.
APPLICANT: Schlegel, Robert
APPLICANT: Schlegel, Robert
APPLICANT: Monahan, John E.
APPLICANT: Monahan, John E.
APPLICANT: Thibodeau, Stephen N.
APPLICANT: Thibodeau, Stephen N.
APPLICANT: Winstrion Novel GENES, COMPOSITIONS, KITS, AND
TITLE OF INVENTION: NETHORS FOR IDENTIFICATION, ASSESSMENT, PREVENTION, TITLE OF INVENTION: METHORS FOR IDENTIFICATION, AND
TITLE OF INVENTION: WINDER: US 10/10/301, 822
CURRENT APPLICATION NUMBER: US 60/339,971
PRIOR APPLICATION NUMBER: US 60/339,971
PRIOR FILING DATE: 2002-102-10
PRIOR FILING DATE: 2002-01-2-10
PRIOR FILING DATE: 2002-05-05
PRIOR APPLICATION NUMBER: US 60/381,988
PRIOR FILING DATE: 2002-05-20
NUMBER OF SEQ ID NOS: 228
SOFTWARE: FastSEQ for Windows Version 4.0
SSECTURENT: 146.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GVPGDLGAPGPSGARGEPGFFGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GESGPSGPAGPIGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               422 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPPGAVGPAGYDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ 721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    842 GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA 901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPPGFEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96.6%; Score 2966; DB 14; Length 1464; 95.6%; Pred. No. 6.4e-146; ive 21; Mismatches 3; Indels 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
CORGANISM: Homo Sapiens
US-10-301-822-28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 520; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          544
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   원장
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
```

```
RESULT 15
(WS-10-291-265-243)
(WS-10-291-265-243)
(WS-10-291-265-244)
(WS-10-291-265-244)
(WS-10-291-265-244)
(WS-10-291-265-244)
(WS-10-291-265-244)
(WS-10-291-265-244)
(WS-10-291-265-244)
(WS-10-291-265-244)
(WS-10-291-265-2127-247)
(WS-10-291-267)
(WS-10-29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     662 GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ 721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181 GSPGSPGPDGKTGPPGPPGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              362 GSEGPQGVRGEPGPPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      482 GPPGERGGPGSRGFPGADGVAGPKGPRGPRGSPCPAGPKGSPGEAGRPGEAGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                542 GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGWMGFPGPKGAAGEPGKAGBPGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               782 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 1464;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96.6%; Score 2966; DB 15; 95.6%; Pred. No. 6.4e-146; iive 21; Mismatches 3;
```

Search completed: September 24, 2004, 11:13:25 Job time : 69.1873 secs

# GenCore version 5.1.6 Copyright (c) 1993 - 2004 Compugen Ltd.

OM protein - protein search, using sw model

September 24, 2004, 11:06:56; Search time 20.9509 Seconds (without alignments) 2497.663 Million cell updates/sec Run on:

US-10-658-989A-4 3070 1 GSEGPEGVRGEPGPPGPAGA......PGPSGDAGPPGPPGKEG 544 Title: Perfect score: Sequence:

Scoring table:

BLOSUM62 Gapop 10.0 , Gapext 0.5

283366 Total number of hits satisfying chosen parameters:

283366 seqs, 96191526 residues

Searched:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

PIR 78:\*
1: pir1:\*
2: pir2:\*
3: pir3:\*
4: pir4:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

### SUMMARIES

		1 (1	1(1	1(1	1 (1	1(1	1 (I	1 (I	1(1	1 (I	) ;	1(1	2 (	2 (I	ē S	1 (I	1(1	$\overline{}$	2 (I	1 (I	2 (T	7	7	7	cha	2 (I	1 (X	1 (X	2 (X	2 (I
	uo	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	alpha	t Z	alpha						alpha	alpha					alpha		alpha
	Description	collagen	lag	collagen	procollagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen	collagen										
	,	! ! !														-														-
		) ! ! !																												
SUMMERTES																		_				_								
20	ΙD	GHUI	821626	CGCH18	T45467	CGHDEC	A41182	B41182	CGRT1S	B40333	A40333	CGB01S	CGHUZV	A43291	I49607	859856	CGB07S	CGHU7L	CGHU2S	I50694	823809	CGHUIV	CGH01E	S18803	528774	CGCH2S	S18251	S28791	CGHUZE	822917
	DB		7	-	N		N	(1	-	Н	N	Н	Н	-	N	N	н	Н		~	Н	Н	-	N	N	Т	N	7	Н	Н
	Length	1464	1453	1042	1418	1487	1419	4	671	1486	1492	779	1496	1373	1497	1464	1049	4	1366	æ	41	œ	0	84	02	964	N	888	1546	9
di	Query	96.6	93.1	90.4	ς.	71.7	71.3	71.3	70.2	69.9	69.4	67.6	62.6	62.4	62.2	62.1	62.1	61.9	61.4	61.3	ö	7	47.0	46.7	46.2	46.0	46.0	'n.	45.6	44.8
	Score		2857	2775	2220	2202	2189	2189	2154	2147	2131	2076.5	σ	1915	1910	1908	1905.5	1901	1886	1881	டி	1457.5	1444	m	1418.5	-	ä	<u>-</u>	σ.	1376
	Result No.	, ,	7	ო	4	Ŋ	v	7	Φ	თ	10	11	12	13	14	15	16											27		

	A54849 16366 118103 CGHU1B CGHU1B A45748 A45748 CGHU4B CGGHU2B A55267	collagen alpha 1(V	collagen alpha 2(I	type VII collagen	collagen alpha 4(I	collagen alpha 1(X	collagen alpha 3(I	collagen alpha 1(V	collagen alpha 1(I	hypothetical prote	collagen alpha 1(I	collagen alpha 2(I	collagen COLF1 - f	collagen alpha 2(I	collagen alpha 5(I	collagen alpha 1(I	collagen alpha 1(X
000000000000000000		2 A54	2 8163	2 I48	1 CGH	2 \$2;	G	2 A4	1 CG	2 T25	1 OGZ	2 T29	2 831	1 CGE	2 A5	2 \$4	2 7X
24 6 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	2944 1763 16949 16649 16649 1758 1759 1712 1712 1712 1712	01	N	7	Н	N	н	7	н	7	н	7	N	Н	7	7	N
		2944 2	1763 2	1549 2	1690 1	1603 2	1670 1	920 2	1669 1	1758 2	1669 1	1759 2	812 2	1712 1	754 2	921 2	1142 2
1375.5 44.8 2944 2 1364.5 44.7 1763 2 1357.5 44.7 1690 1 1339.5 43.6 1600 1 1339.5 43.6 1600 1 1320 43.6 1669 1 1310.5 43.7 1769 1 1310.5 42.7 1769 1 1309 42.7 1669 1 1309 42.7 1769 2 1309 42.7 1769 2 1309 42.6 1759 2 1309 42.6 1759 2 1309 42.6 1759 2 1286.5 41.7 754 2 1275.5 41.7 754 2	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	44.8 2944 2	44.7 1763 2	44.4 1549 2	44.2 1690 1	43.6 1603 2	43.6 1670 1	43.5 920 2	43.0 1669 1	42.7 1758 2	42.7 1669 1	42.6 1759 2	42.5 812 2	41.9 1712 1	41.7 754 2	41.6 921 2	41.6 1142 2

## ALIGNMENTS

	RESULT 1
	collagen alpha 1(I) chain precursor - human Nighternae names: procollagen alpha 1(I) chain
	C.Species: now Sapieus (man) C.Date: 12-Aug-1981 #sequence_revision 04-Oct-1996 #text_change 31-Dec-2000 C.Accession: 160114; S01143; A93335; 155254; A39943; 155237; A35233; S09400; B90567; S11 5769. b70439: 151464: anges.
	S.D., A.J. J.
_	A,Title: Complete nucleotide sequence of the region encompassing the first twenty-five e. A,Reference number: 160114; MUID:88329734; PMID:2843432
	A;Accession: 160114 A;Status: translated from GB/EMBL/DDBJ
	A;Molecule type: DNA A;Residues: 1-369,'L',371-589 <dal></dal>
-	A;Cross-references: GB:M20789; NID:g179593; FIDN:AAB59373.1; PID:g179594 R;Tromp, G.; Kuivanlemi, H.; Stacey, A.; Shikata, H.; Baldwin, C.T.; Jaenisch, R.; Prock:
	Biochem. J. 253, 919-922, 1988 A; Title: Structure of a full-length cDNA clone for the prepro-alpha-1(1) chain of human
	A; Accession: S01143 NULU: 89025644; FMLD:31/8/43
	A;Molecule type: mRNA A;Residues: 1-472 <tro></tro>
	A; Cross-references: EMBL: X07884; NID: 930015; PIDN: CAA30731.1; PID: 930016; GB: M36546; NID A: Note: submitted to the EMB1/GenBank/DDR1 darabases by Procken D. 1 13-IIM-1988
	R;Chu, M.L.; de Wet, W.; Bernard, M.; Ding, J.F.; Morabito, M.; Myers, J.; Williams, C.;
	Nature 310, 337-340, 1984 A,Title: Human proalphal(I) collagen gene structure reveals evolutionary conservation of
	A;Reference number: A93335; MUID:84270697; PMID:6462220 A;Accession: A93335
	A; Molecule type: DNA
	R;Rossouw, C.M.S.; Vergeer, W.P.; du Plooy, S.J.; Bernard, M.P.; Ramirez, F.; de Wet, W.:
	A) Title: DNA sequences in the first intron of the human pro-alpha 1(I) collagen gene enh
	A, Accession: 155254 153234; Mulbicoussos; Filth: 2022/14
	A;Status: translation not shown; translated from GB/EMBL/DDBJ b.whlenia trne. nun
	A; Residues: 1-45 <ros></ros>
	A;Cross-references: GB:U02829; NID:g180387; FIDN:AAA51993.1; FID:g180388 R;Bornstein, P.; McKay, J.; Morishima, J.K.; Devarayalu, S.; Gelinas, R.E.
-	Proc. Natl. Acad. Sci. U.S.A. 84, 8869-8873, 1987
	o cranscriptional control
	A;Accession: A39943 A;Molecule type: DNA
	A;Residues: 1-34 <bor> A;Cross-references: GB:J03559; NID:g180876; PIDN:AAA52052.1; PID:g553238</bor>
-	R;Chu, M.L.; de Wet, W.; Bernard, M.; Ramirez, F.

```
A. Residue: 425-1250, XY, 1252-1328, SY, 1330-1390, XX, 1392-1464 <BER>
A. Residue: 425-1250, XX, 1252-1328, SY, 1330-1390, YX, 1392-1464 <BER>
A. Cross-references: GE: KG1228; ND15: G180391; PIDN: AAA$1995.1; PID: G180392
A. Roce: sequence partially completed for missing nucleotides by A29439
R; Chu, M.L.; Gargiulo, V, Williams, C.J.; Ramirez, F.
A. Biol. Chem. 260, 691-694, 1987
A. Title: Multiaxon deletion in an osteogenesis imperfecta variant with increased type III
A. Reference number: A22161; MUID: 85104934; PMID: 2981843
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Molecule type: mRNA
A;Residues: 1179-1276, 'H',1278-1336,1339-1387,'R',1389-1464 «CHE»
A;Cross-references: GE:S64596; NID:g407589; PIDN:AAB27085-1, PID:g407590
A;Note: sequence extracted from NCBI backbone (NCBIN:136444, NCBIP:136445)
A;Note: does not represent an experimentally determined sequence but three different muts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Experimental source: fetal cell 88-251
R; Cohn, D.H.; Apone, S.; Eyre, D.R.; Starman, B.J.; Andreassen, P.; Charbonneau, H.; Nick
N. Biol. Chem. 263, 14605-14607, 1988
A; Title: Substitution of Cysteine for Glycine within the Carboxyl-terminal Telopeptide of
A; Reference number: 155269; MUID:89008319; PMID:3170557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Molecule type: DNA
A;Residues 472-594, R., 596-607 <CH3>
A;Cross-references: GB:KO3178; GB:KO3179; NID:g178612; NID:g179613; PIDN:AAA51847.1; PID:
A;Note: the authors translated the codon CGT for residue 595 as Pro
A;Note: the authors translated the codon CGT for residue 595 as Pro
A;Nallis: GA.; Starman, B.J.; Zinn, A.B.; Byers, P.H.
Am. J. Hun. Ganet. 46, 1034-1040, 1990
A;Title: Variable expression of osteogenesis imperfecta in a nuclear family is explained
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Molecule type: mRNA
A;Residues: 710-720, E',722-737, 'E',739-745 <WAL>
A;Residues: 710-720, E',722-737, 'E',739-745 <WAL>
A;Note: the authors translated the codons CAG for 721 and CGT for 738 as Glu
R;Forlino, A.; Zolezzi, F.; Valli, M.; Pignatti, P.F.; Cetta, G.; Brunelli, P.C.; Mottes,
R;Forlino, A.; Zolezzi, E.; Valli, M.; Pignatti, P.F.; Cetta, G.; Brunelli, P.C.; Mottes,
R;Forlino, A.; Zolezzi, F.; Valli, M.; Pignatti, P.F.; Cetta, G.; Brunelli, P.C.; Mottes,
A;Title: Severe (type III) osteogenesis imperfecta due to glycine substitutions in the ce
A;Reference number: IS4365; MUID:95187161; PMID:7881420
                                                                                                                                        A; Modecule type: mRNA
A; Residues: 342-352, °C', 354-359 «MIZ»
A; Residues: 342-352, °C', 354-359 «MIZ»
A; Residues: 342-352, °C', 354-359 «MIZ»
A; Residues: General control of the cont
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Asylous translated from GB/EMBL/DDBJ
Asylous: translated from GB/EMBL/DDBJ
Asylous: translated from GB/EMBL/DDBJ
Asylous: translated from GB/EMBL/DDBJ
Asylous: translated SB: 44.7667; NID: 91009093; PIDN: AABSS9576.1; PID: 91009094
Asylous: references: GB: 44.7667; NID: 91009093; PIDN: AABSS9576.1; PID: 91009094
Asylous: CB: 45.18218-18255; 1993
Asylous: Asylou
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Reference number: A35336; MUID:90252792; PMID:2339700
A;Accession: A35336
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A, Experimental source: normal dermal fibroblast culture
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Molecule type: mRNA
Residues: 1179-1387,'R',1389-1464 <CH7>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Molecule type: mRNA
A;Residues: 1179-1276,'H',1278-1464 <CH5>
A;Experimental source: fetal cell 86-237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Molecule type: mRNA
A;Residues: 1179-1336,1339-1464 <CH6>
A;Residues: 1179-1336,1339-1464 <CH6>
A;Residues: Berace: fetal cell 86-146
A;Accession: E47426
                            A;Accession: I52905
A;Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Molecule type: mRNA
Residues: 1179-1464 <CH4>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Accession: A90476
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A, Accession: A22161
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Accession: A47426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Accession: C47426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Accession: I55269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Accession: B47426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: protein
A; Molecule type: protein
A; Residues: 175-187; 274-287, 'P', 289 cBAE>
A; Residues: 175-187; 274-287, 'P', 289 cBAE>
A; Molecule type: 175-187; 274-287, 'P', 289 cBAE>
A; Molecule collagen alpha 1(S) (I) isolated from bone after pepsin digestion
B; Deak, S.B.; Scholz, P.M.; Amenta, P.S.; Constantinou, C.D.; Levi-Minzi, S.A.; Gonzalez
J; Biol. Chem. 266, 21827-21832, 1991
J; Exp. The substitution of argainine for glycine 85 of the alpha 1(I) procollagen chain
copperative melting of intact type I collagen.
A; Reference number: 155342; MUID:92042092; PMID:1718984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: mRNA
A; Residues: 258-268;1347-1357 < DEA>
A; Residues: 258-268;1347-1357 < DEA>
A; Residues: 258-268;1347-1357 < DEA>
A; Cross-references: GB:S67495; NID:9239007; PIDN:AAB20350.1; PID:9239008
A; Cross-references: GB:S67495; NID:9239007; PIDN:AB20350.1; PID:9239008
A; Note: sequences from the 5' and 3' ends only are shown; mutant sequence 263-Arg report R; Morgan, P.H.; Jacobs, H.G.; Segret, J.P.; Cunningham, L.W.
C. Biol. Chem. 245, 5042-5048, 1970
A; Title: Comparative study of glycopeptides derived from selected vertebrate collagens.
A; Reference number: A92069; MUID:71001508; PMID:4319110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Cross-references: GB:M10627; NID:g180383; PIDN:AAA51992.1; PID:g553226
R;Wirtz, M.K.; Keene, D.R.; Hori, H.; Glanville, R.W.; Steinmann, B.; Rao, V.H.; Hollist
J. Biol. Chem. 265, 6312-6317, 1990
A;Tito oncovalent association of excised alpha1(I) amino-termina
rome, type VII.
A;Reference number: A35233; MUID:90202908; PMID:2318855
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Note: this propeptide fragment remained non-covalently bound to a defective, uncleaved R; Weil, D.; d'Alessio, M.; Ramirez, F.; de Wet, W.; Cole, W.G.; Chan, D.; Bateman, J.F. Exmo J. 8, 1705-1710, 1989
A; Title: A base substitution in the exon of a collagen gene causes alternative splicing A; Reference number: $09400; MUID:89356643; PMID:2767050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ;Molecule type: mRNA;
;Residues: 156-183 <WEI>
;Click, E.M.; Bornstein, P.
iochemistry 9, 4699-4706, 1970
;Title: Isolation and characterization of the cyanogen bromide peptides from the alphal;
;Reference number: A90567; MUID:71038625; PMID:5529814
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Molecule type: mRNA
A;Residues: 281-302;402-420;823-843;925-944;1026-1045;1143-1162 <LAB>
R;Wirtz, M.K.; Rao, V.H.; Glanville, R.W.; Labhard, M.E.; Pretorius, P.J.; de Vries, W.N
Connect. Tissue Res. 29, 1-11, 1993
A;Tille: A cysteine for glycine substitution at position 175 in an alpha 1 (I) chain of
A;Reference number: 152905; MUID:93339042; PMID:8339541
                                                                                                    collagen gene. Promoter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A Molecule type: protein
A, Residues: 263-268 **MOR>
A, Residues: 263-268 **MOR>
A, Residues: 263-268 **MOR>
A, Residues: 263-268 **MOR>
A, Note: attachment of 2-0-alpha-D-glucosyl-O-beta-D-galactose to 5-hydroxylysine
B, Labhard, M.E., Hollister, D.W.
Matrix: 10, 124-130, 1916
A, Title: Segmental amplification of the entire helical and telopeptide regions of the
A, Reference number: 815989; MUID: 90326017; PMID: 2374517
J. Biol. Chem. 260, 2315-2320, 1985
A;Title: Fine structural analysis of the human pro-alpha 1 (I)
A;Reference number: I55237; MUID:85130970; PMID:2857713
A;Accession: I55237
                                                                                                                                                                                                                                                                                        A;Status: translation not shown; translated from GB/EMBL/DDBJA;Molecule type: DNA
A;Residues: 1-34 <CH2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Molecule type: protein A; Residues: 33-52 < WIR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: A35233
```

tyŗ

```
A;Gene: COLIAI
A;Thirtrons: 770/3; 788/3; 806/3; 842/3; 860/3; 878/3; 932/3; 968/3; 1004/3; 1022/3; 1058/7
A;Thirtrons: 770/3; 788/3; 806/3; 842/3; 860/3; 878/3; 932/3; 968/3; 1004/3; 1022/3; 1058/7
C;Superfamily: collagen alpha 1(I) chain; fibrillar collagen carboxyl-terminal homology; C;Reywords: coilage coil; extracellular matrix; glycoprotein; heterotrimer; triple helix F:1-22/Domain: signal sequence #status predicted <SIG>F:23-151/Domain: amino-terminal propeptide #status predicted <PGO>F:30-89/Domain: von Willebrand factor type C repeat homology <VWC>F:30-89/Domain: von Willebrand factor type C repeat homology <AMC>F:1224-1453/Product: collagen alpha 1(I) chain #status predicted <AMT>F:1224-1453/Domain: fibrillar collagen carboxyl-terminal homology <PCC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGPPGARGPSGPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  411 GPSGPPGPKGNSGEPGAPGNKGDTGAKGEPGATGVQGPPGPAGEEGKRGARGEPGPSGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Status: preliminary; translated from GB/EMBL/DDBJ
;Wolecule type: DNA
;Residues: 1-80,7E',82-105,7D',107-147 <REF>
;Cross-references: EMBL:X54876; NID:g50486; PIDN:CAA38657.1; PID:g50487
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ·.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1453;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 93.1%; Score 2857; DB 2; Best Local Similarity 91.4%; Pred. No. 9.5e-132; Matches 497; Conservative 28; Mismatches 19;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          III and IX collagen mRNAs.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Accession: S7243, S1674, Azine precursor - mouse
Collagen alpha 1(I) chain precursor - mouse
Collagen alpha 1(I) chain precursor - mouse
Collagen alpha 1(I) chain precursor - mouse
Collagen S7243, S16374; Azines mouse
Collagen 13-Aug-1999
Collagen: S7243, S16374; Azines 1149559; 149557; S39789; 148300; S21626
Rill, S.W.; Khillan, U.; Prockop, D.J.
Matrix Biol. 14, S93-S95, 1994
Aprite: The complete cDNA coding sequence for the mouse pro-alpha-1(I) chain of type
Aprecession: S7243
Aprecession: S72434
Aprecession: S72434
Aprecession: S72434
Aprecession: S724344
Aprecession: S72434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     type
                                                                                                                                            for the C-propeptide domain.
                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                  421
                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAPGLQGMPGBRGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          841
                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     901
                                                                                                                                                                                                                                                                               422 GPGGPPGPRGNSGBPGAPGSKGDTGAKGBPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                        GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGPAGPKGSPGFAGFKGF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPGSPGFPGFRGPFGFAGDGRFGFPGFPGFRGQAGWGFPGFKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGPPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                         GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGAVGPAGKDGBAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             662 GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                         Gaps
A;Status: translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Molecule type: DNA
A;Molecule type: DNA
A;Rosidues: 1187-1194, 'C',1196-1220 <COH>
A;Kosidues: 1187-1194, 'C',1196-1220 <COH>
A;Koss-references: GB:M23213; NID:g340842; PIDN:AABS9363.1; PID:g499622
A;Note: mutant sequence from a patient with mild osteogenesis imperfecta
R;Maekelae, J.K.; Raassina, M.; Virta, A.; Vuorio, E.
Nucleic Acids Res. 16, 349, 1998
A;Title: Human pro-alpha-1(1) collagen: cDNA sequence for the C-propeptic
                                                                                                                                                                                                                       ö
                                                                                                                                                                                    Length 1464;
                                                                                                                                                                                                                       3; Indels
                                                                                                                                                                              Query Match
96.6%; Score 2966; DB 1;
Best Local Similarity 95.6%; Pred. No. 5e-137;
Matches 520; Conservative 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKEG 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                602
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 842
                                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                           482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      542
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      782
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                           qq
                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                              ద
                                                                                                                                                                                                                                                                                                                                                                                                               8 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ∂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8 & 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8 B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9 6 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ठ
```

8 8 8 g

8 8

q

ò

ò

a

ò

8 8

셤

```
Collagen alpha 1(II) chain precursor [imported] - horse
NyAlternate names: type II collagen
NyAlternate names: type II collagen
CyBoteles: Squares caballus (domestic horse)
CyBoteles: 31-Jan-2000 #sequence_revision 31-Jan-2000 #text_change 04-Mar-2000
CyAccession: T45467
Ry Richardson, Dw., Dodgey, G.R.
Ry Richardson, Dw., Dodgey, G.R.
Submitted to the EMBL Data Library, June 1996
A, Description: Cloning of equine type II collagen and modulation of its expression in equal part of the EMBL Data Library, June 1996
A, Description: Cloning of equine type II collagen and modulation of its expression in equal part of the EMBL Data Library; translated from GB/EMBL/DDBJ
A, Gocession: T45467
A, Residues: 1-1418 < RIC>
A, Residues: 1-1418 < RIC>
A, Collagen alpha 1(I) chain; fibrillar collagen carboxyl-terminal homology;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      679
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         614
                              379
                                                                                                                                                                                     300
                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                             559
                                                                                                                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                                                                                                                619
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GEAGPPGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGETGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      315 GPEGAQGPRGEPGTPGSPGPAGAAGNPGTDGIPGAKGSAGAPGIAGAPGFPGPRGPPGPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    375 GATGPLGPROQTGEPGIAGFKGEQGPKGEPGPAGPQGAPGPAGEEGKKGARGEPGGPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                    GSPGSPGPDGKTGPPGPAGQDGRPGPAGPPGARGQAGVMGFPGPKGAAGEPGKPGERGAP
                                                                                                                                                                                        GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                            GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                  GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGPPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                    GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match 72.3%; Score 2220; DB 2; Best Local Similarity 72.6%; Pred. No. 6.5e-101; Matches 395; Conservative 37; Mismatches 112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKZG 743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              495
                                                                                        181
                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                   200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 4
T45467
                                                                                                                                 a
                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         d
                                                                             ð
                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A.Molecule type: protein
A.Residues: 1-1036 -4HG>
A.Residues: 1-1036 -HHG>
A.Rote: this is the latest in a series of papers from these workers elucidating the sequence this is the latest in a 270-726, 1972
B.A.Rote: Dailongy. Res. Commun. 48, 720-726, 1972
B.A.Reference number: A90181, MUID: 72243016; PMID: 5047697
A.Reference number: A90181, MUID: 72243016; PMID: 5047697
A.Reference number: A90181, MUID: 72243016; PMID: 5047697
A.Reference number: A90181
A.Molecule type: protein
A.Residues: 1037-1042 - kmrs
A.Residues: 1037-1042 - kmrs
A.Residues: 1037-1042 - kmrs
A.Rote: residues: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 collagen alpha 1(I) chain - chicken (tentative sequence) (fragments)
C;Species: Gallus gallus (chicken)
C;Species: Gallus gallus (chicken)
C;Date: 12-Aug-1981 #sequence_revision 06-Jul-1982 #text_change 31-Mar-2000
C;Accession: A50458; A90181; A02857
R;Highberger, J.H.; Corbett, C.; Dixit, S.N.; Yu, W.; Seyer, J.M.; Kang, A.H.; Gross, J.B.;Chemistry 21, 2048-2055, 1985
A;Title: Anino acid sequence of chick skin collagen alpha1(I)-CB8 and the complete prima A;Reference number: A90458; MUID:82231995; PMID:7093229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                                                                                                                                                     GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGNNGAPGNDGAKGDTGAPGAPGSQ 710
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  830
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  319
                                                                                                                   300
                                                                                                                                                                     650
                                                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                                                              770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSEGPQGSRGEPGPPGPAGAAGPAGNPGADGQPGAKGATGAPGIAGAPGFPGARGPSGPQ 259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121 GPPGERGCPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPSGAPGPKGNSGEPGAPCNKGDTGAKGEPGPAGVGPPGPAGEEGKRGARGEPGPAGLP
                GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                      GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                               GPPGAVGPAGKDGEAGAQGAPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                         GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDAGAFGAPGSE
                                                                                                                                                                                                                                                                                                                             GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                         GSPGSPGKTGPPGPAGQDGRPGPAGPPGARGQAGWGFPGPKGTAGEPGKAGERGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  90.4%; Score 2775; DB 1; Length 1042; 89.0%; Pred. No. 6.9e-128; ive 28; Mismatches 32; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity
Matches 484, Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKEG 894
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Accession: A90458
                                                                  531
                                                                                                                   241
                                                                                                                                                                     591
                                                                                                                                                                                                                                                                           651
                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        831
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61
                   181
                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  771
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                891
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 3
CGCH1S
```

g

ò

d

 $\dot{\delta}$ 

S

gB

```
A;Accession: S05000
A;Accession: S05000
A;Molecule type: DNA
A;Molecule type: DNA
A;Molecule type: DNA
A;Molecule type: DNA
A;Cross-teferences: EMBL:X16188; MID:929951; PIDN:CAA34278.1; PID:91335018; PIDN:CAA3427;
PIDN:CAA34283.1; PID:91335023; PIDN:CAA34284.1; PID:91335024
R;Rogaert, R.; Tiller, G.E.; Weis, M.A.; Gruber, H.E.; Rimoin, D.L.; Cohn, D.H.; Eyre, D.J. Bol. Chem. 267, 22522-22526, 1992
A;Title: An amino acid substitution (Gly853-->Glu) in the collagen alpha 1(II) chain proc
                                                                                                                                                                                                                                                                                                                                                          A;Note: alternative splice form 2; splicing appears to be under developmental regulation RS,Su, MW.; Benson-Chanda, V.; Vissing, H.; Ramirez, F. Genomics 4, 438-441, 1989
A;Title: Organization of the exons coding for Pro alpha-1(II) collagen N-propeptide conf. A;Reference number: A30147; MUID:89233138; PMID:2714801
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  pri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A, Molecule type: DNA
A, Residues: 171-172, °C', 174-175 <ALA>
A, Note: mutant sequence from a family with family with primary generalized osteoarthriti
R;Diab, M., Mu, J.J.; Eyre, D.R.
Biochem. J. 314, 327-332, 1996
A;Title: Collagen type IX from human cartilage: a structural profile of intermolecular c
A, Reference number: $64673; MUID:96195147; PMID:8660302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Wolecule type: protein

R;Residues: 188-189, X*, 191-195;1224-1230, X*, 1232-1236 <DIA>

R;Residues: 188-189, X*, 191-195;1224-1230, X*, 1232-1236 <DIA>

R;Franci, S.; Marzin, E.; Boutillon, M.M.; Lafont, R.; Lechene de la Porte, P.; Herbage, Eur J. Biochem. 234, 125-131, 1995

Eur J. Biochem. 234, 125-131, 1995

FA;Title: Immunobistochemical and biochemical analyses of 20000-25000-year-old fossil car A;Reference number: S63514; MUID:96096730; PMID:8629631
A;Cross-references: EMBL:X16711; NID:g30040; PIDN:CAA34683.1; PID:g30041
A;Note: alternative splice form 1
R;Note: alternative splice form 1
J: Biol. Chem. 265, 10334-10339, 1990
J: Biol. Chem. 265, 10334-10339, 1990
A;Title: Difference range a cysteine-rich domain in the amino-terminal propept A;Reference number: A35428; MUID:90285153; PMID:2355003
A;Accession: A35428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GB:M32168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a cause of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A,Accession: A44309
A,Status: nucleic acid seguence not shown, not compared with conceptual translation
A,Molecule type: DNA; mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                D.L.; Cohn, D.H.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    II collagen gene (COL2A1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              II collagen gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GB:M25656; GB:M25730;
ckop, D.J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  as
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PID:9557054
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A Molecule type: mRNA
A;Residues: 501-676, A',678-783,'A',785-831,'PA',834,'F',836-1214 <RAM>
A;Residues: 501-676, A',678-783, NID:930037; PIDN:CA932030.1; PID:9930050
R;Vikkula, M.; Peltonen, L.
R;Vikkula, M.; Peltonen, L.
A;Title: Structural analyses of the polymorphic area in type II collagen g
A;Reference number: 805000; MUID:89325561; PMID:2753125
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (COL2A1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: protein
A; Residues: 243-261;575-590;756-763,'X',765-779 <FRA>
A; Residues: 243-261;575-590;756-763,'X',765-779 <FRA>
A; Tiller, G.E.; Weis, M.A.; Polumbo, P.A.; Gruber, H.E.; Rimoin, Am. J. Hum. Genet. 56, 188-395, 1995
A; Title: An RNA-splicing mutation (G+51VS20) in the type II colla A; Reference number: 138867; MJID:95150028; PMID:7847372
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A,Accession: I38867
A,Status: preliminary, translated from GB/EMBL/DDBJ
A,Molecule type: DNA
A,Residues: 440,'G',442-456,'E',458-480,'P',482-509 <TIL1>
A,Cross-references: EMBL:U15195; NID:g557053; PIDN:AAB60370.1;
Submitted to the EMBL Data Library, December 1988
A,Reference number: $04892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Molecule type: DNA
A;Residues: 104-157, P', 159-236 <SUM>
Cross-scheences: GB:J030065; GB:M23660; GB:M25655; GB:M25656
A;Ala-Kokko, L.; Baldwin, C.T.; Moskowitz, R.W.; Prockop, D.J.
Proc. Natl. Acad. Sci. U.S.A. 87, 6565-6568, 1990
A;Title: Single base mutation in the type II procollagen gene
A;Reference number: A94227; MUID:90370826; PMID:1975693
                                                                                                                                                                                                                                                    A;Status: not compared with conceptual translation A;Molecule type: mRNA
A;Residues: 27-81,'L', 83-103 <RYA2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 5

CORRIGO
COLIDAGE alpha I(II) chain precursor (validated) - human
Nicotratans: chondrocalatin, collagen alpha I(II) chain precursor splice form 1; collagen
Nicotratans: chondrocalatin, collagen alpha I(II) chain precursor splice form 1; collagen
Nicotratans: chondrocalatin, collagen alpha I(II) chain precursor splice form 1; collagen
Coffacession: Adsila; Septim: collagen alpha I(II) chain precursor splice form 1; collagen
Coffacession: Adsila; Septim: collagen alpha I(II) chain precursor splice form 1; collagen
Coffacession: Adsila; Septim: A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A,Molecule type: mRNA
A,Residues: 7-28,'R',99-157,'P',159-440,'G',442-456,'E',458-640,'A',642-831,'PA',834,'F'
                          GVPGDLGAPGPSGARGEPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                  615 GVPGEAGAPGLVGPRGERGFPGERGSPGAQGLQGARGLPGTPGTDGPKGASGPAGPPGAO 674
                                                                                                                                                                         GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPA 540
                                                                                                                                                                                                               GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                              GKDG 858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKEG 544
                              301
                                                                                                                                                                         361
                                                                                                                                                                                                                                             675
                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                     735
                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
                              ઠે
                                                                                      유
                                                                                                                                                                  à
                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                          \delta
                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
```

ó

09

120

240

623 300 683

180

743 420 480

803

```
A.fitle: Expression of the mouse alpha 1(II) collagen gene is not restricted to cartilage A;Reference number: A44885; MUID:91347939; PMID:1879363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nucleotide sequence, exon structure, and
AjCross-references: GB:M23759; NID:g180845; EMBL:X03320; GB:M24938; NID:g30104
A;Note: the GenBank PID is based on an incorrect reading frame
A;Accession: I37250
A;Status: translated from GB/EMBL/DDBJ
A;Molecule type: DNA
A;Residus: 541-560 <SAN3>
A;Residus: 541-560 <SAN3>
A;Accession: I37251
A;Accession: I37251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Adil82

collagen alpha 1(II) chain precursor - mouse

collagen alpha 1(II) chain precursor - mouse

c)species: Mus musculus (house mouse)

C;pace: 28-May-1992 #sequence_revision 28-May-1992 #text_change 13-Aug-1999

C;Accession: A41182; A44885

R;Metsaeranta, M.; Tonan, D.; de Crombrugghe, B.; Vuorio, E.

A;Title: Mouse type II collagen gene. Complete nucleotide sequence, exon stransference number: A41182; MUID:91384489; PMID:1885613

A;Accession: A41182

A;Status: preliminary; not compared with conceptual translation

A;Molecule type: DNA....
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPAGPPGPPGDIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                564 GRPGDAGPQGKVGPSGAPGEDGRPGPPGPQGARGQPGVMGFPGPKGANGEPGKAGEKGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGBAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              864 GPOGPSGAPGPOGPTGVTGPKGARGAQGPPGATGFPGAAGRVGPPGSNGNPGPPGPPGPS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .;
0
                                                                                                                                                                                                                                                                                                                                                                                                Length 1487;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                            71.7%; Score 2202; DB 1;
llarity 71.9%; Pred. No. 5e-100;
Conservative 40; Mismatches 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Residues: 1-1419 < MET>
A; Cross-references: GB: MG5161
R; Choah, K.S.; Lau, E.T.; Au, P.K.; Tam, P.P.
Development 111, 945-953, 1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     927
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Sim
Matches 391;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A. Residues: A24561; MUID:86104139; PMID:3002437
A. Residues: A24561
A. Molecule type: DNA
A. Residues: 1296-1358 «NUN2>
A. Residues: 1296-1358 «NUN2>
A. Residues: 1296-1358 «NUN2>
A. Residues: Libitation is not annotated in GenBank entry HUMCCT2A, release 111.0
A. Note: the codons given for 133-Lys (AGG) and 1350-Gly (GCA) are inconsistent with the R. Sangiorgi, F.O.; Benson-Chanda, V.; de Wet, W.J.; Sobel, M.E.; Tsipouras, P.; Ramirez, Nucleic Acids Res. 13, 2207-2225, 1985
A. Accession: Say 137249; MUID:8215609; PMID:2987845
A. Accession: Say 137249; MUID:8215609; PMID:2987845
A. Accession: Say 144541-578; 786-802; 1055-1056, N', 1058-1068, T', 1070-1109; 1200-1
                              A; Residues: 752-831, 'PA', 834,'F', 836-1005,'K', 1007-1036,'Q',1038-1052,'E',1054-1068,'T', A; Cross-references: GB:L00977; NID:g180812; PIDN:AAB23914.1; PID:g258774
A; Note: sequence extracted from NCBI Dackbone (NCBIP:11731); parts of this sequence wer A; Note: this translation is not annotated and this publication is not cited in GenBank A; Note: mutant sequence associated with perinatal lethal hypochondrogenesis
A; Note: mutant sequence associated with perinatal lethal hypochondrogenesis
A; Niller, G.B.; Rimoin, D.L.; Murray, L.W.; Cohn, D.H.
Proc. Natl. Acad. Sci. U.S.A. 87, 3889-3893, 1990
A; Title: Tandem duplication within a type II collagen gene (COL2A1) exon in an individual approximation number: S16502; MUID:90251662; PMID:2339128
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                prop
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: DNA
A; Residues: 1245-1295 cSTR1>
A; Cross-references: EMBL:X00339; EMBL:X00298; NID:g394699; PIDN:CAA25092.1; PID:g4378975
A; Accession: B21733
A; Molecule type: DNA
A; Molecule type: DNA
A; Residues: 894-909, 'PE' <STR2>
A; Cross-references: GB:K01785; NID:g30035; PIDN:CAA25082.1; PID:g1335032
A; Cross-references: GB:K01785; NID:g30035; M.F.; Martin, G.R.; Yamada, Y.
Biochemistry 24, 6343-6348, 1985
A; Title: Isolation and partial characterization of genomic clones coding for a human pro
                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: DNA
A; Residues: 1164-1184, GPSGKDGANGIPGPI', 1185-1199 <TILL>
A; Residues: 1164-1184, GPSGKDGANGIPGPI', 1185-1199 <TILL>
A; Cross --references: EMBL:M37126, NID: 9180808; PIDN:AA52037.1; PID:9180809
A; Cross --references: EMBL:M37126, NID:9180809
A; Cheah, K.S.E.; Stoker, N.G.; Griffin, J.R.; Grosveld, F.G.; Solomon, E.
Proc. Natl. Acad. Sci. U.S.A. 82, 2555-2559, 1985
A; Title: 1dentification and characterization of the human type II collagen gene (COL2A1)
A; Reference number: A02858; MUID:85190534; PMID:3857598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                to the human typ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Molecule type: DNA
A;Residues: 1032-1056,Nv,1058-1068,'T',1070-1487 <CHE>
A;Cross-references: GB:J00116; NID:g180395; PIDN:AAA51997.1; PID:g180396
A;Cross-references: GB:J00116; NID:g180395; PIDN:AAA51997.1; PID:g180396
R;Elima, K.; Vuorio, T.; Vuorio, E.; Vuorio, E.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A, Molecule type: protein
A, Molecule type: protein
A, Rosidues: XE', 1244-1246, 'N', 1248, 'X', 1250-1265;1295-1305;1395-1408 < VAN>
A, Residues: XE', 1244-1246, 'N', 1248, 'X', 1250-1265;1295-1305;1395-1408 < VAN>
A, Note: chondrocalcin identified as released collagen 1(II) chain carboxyl-terminal 1, R, Strom, C.M.; Upholt, W.B.
Nucleic Acids Res: 12, 1025-1038, 1984
A, Title: Isolation and characterization of genomic clones corresponding to the human A, Reference number: A21733; MUID:84118798; PMID:6320112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              R;van der Rest, M.; Rosenberg, L.C.; Olsen, B.R.; Poole, A.R.
Biochem. J. 237, 923-925, 1986
A;Title. Chondrocalcin is identical with the C-propeptide of type II procollagen. A;Reference number: A57033; MUID:87099927; PMID:3800925
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Molecule type: DNA; mRNA
A;Residues: 1175-1487 EELJ>
A;Crosa-references: ERBE:X06268; NID:g30096; PIDN:CAA29604.1; PID:g30097
A;Experimental source: fetal epiphyseal cartilage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: translated fr
A;Molecule type: DNA
A;Residues: 7-28 <SAN2>
```

```
Query Match
Best Local Similarity 71.77
Matches 390; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    source: skin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: protein A; Residues: 5-19 < KAN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Contents: CNBrl
A; Accession: A90552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A, Experimental R; Bornstein, P.
                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               804
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT
                                                                                                                                                                             셤
                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                   원
                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             셤
                                                                                                            셤
                                                                                                                                              ઠે
                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                  ò
                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      collagen alpha 1(II) chain precursor (long splice form) - mouse
C,Species: Mus musculus (house mouse)
C,Species: Mus musculus (house mouse)
C,Accession: B4182
R;Metsaeranta, M.; Toman, D.; de Crombrugghe, B.; Vuorio, E.
C,Accession: B4182
R;Metsaeranta, M.; Toman, D.; de Crombrugghe, B.; Vuorio, E.
A;Title: Mouse type II collagen gene. Complete nucleotide sequence, exon structure, and A,Racefactor: Mull 182; MUD:91358489; PMID:1885613
A,Accession: B4182
A,Accession: B4182
A,Racefacte: preliminary; not compared with conceptual translation
A,Nolecule type: DNA
A,Residues: 1-1487 - MET.
A,Residues: 1-1487 - MET.
A,Cross-references: GB:M65161
C;Superfamily: collagen alpha 1(I) chain; fibrillar collagen carboxyl-terminal homology; C;Reywords: alternative splicing; coiled coil; extracellular matrix; glycoprotein; trime F;33-91/Domain: von Willabrand factor type C repeat homology <WC>
F;1259-1487/Domain: fibrillar collagen carboxyl-terminal homology <FCC>
              A;Molecule type: DNA
A;Residues: 1-28 cCHE.
A;Residues: 1-28 cCHE.
A;Residues: 1-28 cCHE.
A;Cross-references: GB:863190; NID:g234368; PIDN:AAB19627.1; PID:g234369
A;Cross-references: GB:863190; NCBI backbone (NCBIN:63190, NCBIP:63192)
A;Note: sequence extracted from NCBI backbone (NCBIN:63190, NCBIP:63192)
C;Superfamily: collagen alpha I(I) chalin; fibrillar collagen carboxyl-terminal homology;
C;Keywords: alternative splicing; coiled coll; extracellular matrix; glycoprotein; trime
P;1191-1419/Domain: fibrillar collagen carboxyl-terminal homology <FCC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                    375
                                                                                                                                                                                                                                                                                                               GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                              GPPCAVGPACKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GIPGEAGAPGLVGPRGERGFPGERGSPGAQGLQGPRGLPGTPGTDGPKGAAGPDGPPGAQ 675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                       GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                      ô
                                                                                                                                                Query Match 71.3%; Score 2189; DB 2; Length 1419; Best Local Similarity 71.7%; Pred. No. 2.1e-99; Matches 390; Conservative 39; Mismatches 115; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ckoc 859
A; Accession: A44885
                                                                                                                                                                                                                         М
                                                                                                                                                                                                                                                                                                                          376
                                                                                                                                                                                                                                                                                                                                                                                             436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 556
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           964
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541
                                                                                                                                                                                                                                                       316
                                                                                                                                                                                                                                                                                                                                                             121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
                                                                                                                                                                                                                                                                                          61
                                                                                                                                                                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                496
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 7
                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                       음 강
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                   성 음
                                                                                                                                                                                                                                                                                                                                                                                                                     \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \dot{\delta}
```

```
collagen alpha 1(I) chain - rat (tentative sequence) (fragments)
C;Species: Rattus norvegicus (Norway rat)
C;Date: 13-Jul-1981 #sequence_revision 13-Jul-1981 #text_change 31-Mar-2000
C;Accession: A90559; A90552; A92029; A90353; A90566; A90357; A90362; A90379; A91209; A912
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   exti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       skin cc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        absence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A, Molecule type: protein
A,Residues: 1-19 <BO1>
A,Residues: 1-19 <BO1>
A,Residues: 1-19 <BO1>
A,Residues: 1-19 <BO1>
A,Residues: sequences from skin and tendon appear to be identical
A,Note: the amino-terminal tetrapeptide may be removed by limited proteolysis during
R, Kang, A.H.; Bornstein, P.; Piez, K.A.
Biochemistry 6, 788-795, 1967
A,Title: The amino acid sequence of peptides from the cross-linking region of rat ski
A,Reference number: A90552; MUID:67162268; PMID:5337886
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The
                                                  ô
                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            923
                                                                                                                                             443
                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                     563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     684 ĠIPĠEAĠAPĠLVĠPRĠERĠPPĠERĠSPĠAQĠLQĠPRĠLPĠTPĠTPĠPKĠAAĠPDĠPPĠAQ 743
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       803
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               863
                                                                                                                                                                                                                                       503
                                                                                                                                                                                                                                                                                                                                                                                                                               623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ribornstein, P.
Biochemistry 8, 63-71, 1969
A;Title: Comparative sequence studies of rat skin and tendon collagen. II.
A;Reference number: A96559; MUID:69155173; PMID:5777344
A;Contents: CNBr0 and CNBr1
A;Accession: A90559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                           61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                   GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GAPCLECMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                               GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                  444 ĠATĠPLGPKĠQAGBPĠIAĠFKĠDQĠPKĠETĠPAĠPĠGAPĠPAĠEEĠKĸĠAŔĠEPĠGAGPI
                                                                                                                                                                                                                                                                                     GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                  Gaps
                                                  ö
  Length 1487;
71.3%; Score 2189; DB 2; 71.7%; Pred. No. 2.1e-99; iive 39; Mismatches 115;
```

õ

Φ

```
A,Note: the composition of peptides comprising residues 1-9 and 1-19 confirms the sequence A,Note: this region (residues 651-671 above) probably corresponds to positions 1032-1052 (Comment: Prolines and lyaines at the third position of the tripeptide repeating unit (ed and subsequently 0-glycosylated.
C,Comment: The order of the mine CNBr peptides in the alpha 1(1) chain of rat skin collaction of comment: The complete chain contains 1052 residues.
C,Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxyl-terminal homology; C,Reywords: blocked amino end; coiled coil; extracellular matrix; glycoprotein; hydroxyl) F;1/Modified site: allysine (Lys) #status experimental
F;103,424,547/Binding site: carbohydrate (Lys) (covalent) #status experimental
F;103/Modified site: 5-hydroxylysine (Lys) (spartial) #status experimental
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             040333

Collagen alpha 1(II) chain precursor - African clawed frog

C;Species: Xenopus laevis (African clawed frog)

C;Decies: Aenopus laevis (African clawed frog)

C;Decies: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 10-Sep-1999

C;Accession: B40333

R;Su, W.W.; Suzuki, H.R.; Bieker, J.J.; Solursh, M.; Ramirez, F.

J. Cell Biol. 115, 565-575, 1991

A;Title: Expression of two nonallelic type II procollagen genes during Xenopus laevis emb
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary
A;Molecule type: mRNA
A;Molecule type: mRNA
A;Molecule type: mRNA
A;Rosidus: 1-1486 <8UA>
A;Cross-references: GB:M63595
C;Superfamily: collagen alpha 1(I) chain; fibrillar collagen carboxyl-terminal homology;
C;Keywords: colled coil; extracellular matrix; glycoprotein; trimer; triple helix
F;37-96/Domain: von Willebrand factor type C repeat homology <VWC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      200 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAXGANGAPGIAGAPGFPGARGPSGPQ 259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               320 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                380 GSPGSPGPDGKTGPPGPAGZBGRPGPAGPPGARGQAGVMGFPGPKGTAGEPGKAGERGVP 439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   559
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241 GPPGAVGPAGKUGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        260 GPSGAPGPKGNSGEPGAPGNKGDTGAKGEPGPAGVQGPPGPAGEGKRCARGEPGPSGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        440 GPPGAVGPAGKDGEAGAQGAPGPAGERGEQGPAGSPGFQGLPGPAGFPGEAGKPGZZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            500 GVPGDLGAPGPSGARGERGEPGERGVQGPPGPAGPRGNNGAPGBBGAKGDTGAPGAPGSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361 GAPGLEGMPGERGAAGLPGPKGDRGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               70.2%; Score 2154; DB 1; Length 671; 77.3%; Pred. No. 5.9e-98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              36; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPAGPAGPPGPIG 493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       632 GPPGPPGPPG 644
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity 77.39
Matches 381; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                584
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      qq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ΩD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: protein
A; Rolecule type: protein
A; Rolecule type: protein
A; Rosidues: 239-418 < BA2>
A; Experimental source: skin
R; Butler, W.T.; Underwood, S.P.; Finch Jr., J.E.
B; Sochemistry 13, 2946-2953, 1974
A; Title: Chemical studies on the cyanogen bromide peptides of rat skin collagen. Amino a
A; Reference number: A90379; MUID: 74271984; PMID: 4366532
A; Rolecule type: protein
A; Residues: 419-567 < BU3>
A; Wolecule type: protein
A; Residues: 419-567 < BU3>
A; Rolecule type: protein
A; Residues: 419-567 < BU3>
A; Rolecule type: protein
A; Residues: 419-567 < BU3>
A; Reference skin
B; Stoltz, M.; Timpl, R.; Furthmayr, H.; Kuehn, K.
Eur. J. Biochen. 37, 287-294, 1973
A; Title: Structural and immunogenic properties of a major antigenic determinant in neutral A; Reference number: A91209; MUID: 74011954; PMID: 4126850
A; Contents: CNBr6
A; Acontents: CNBr6
A; Molecule type: A91209; MUID: 74011954; PMID: 4126850
A; Acontents: CNBr6
A; Acontent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ayacession: A01566
Aymolecule type: protein
Ayacession: A01566
Aymolecule type: protein
Ayacession: A0159 suction
Ayacession: A013 suction
Ayacession: A013 suction
By Ballan, G.; Click, E.M.; Bornstein, P.
By Cohemistry 10, 4470-4478, 1971
Ay Title: Structure of rat skin collagen alphal-CB8. Amino acid sequence of the hydroxyla
Ayacession: A00357; MUID:72136131; PMID:4335087
Ayacontens: CMBr8
Ayacession: A00357; MUID:72136131; PMID:4335087
Ayacession: A00358 such
Ayacession: A00360; E.M.; Hermodson, M.A.; Bornstein, P.
By Ballan, G.; Click, E.M.; Hermodson, M.A.; Bornstein, P.
By Cohemistry 11, 3798-38066, 1972
AyTitle: Structure of rat skin collagen alphal-CB8. Amino acid sequence of the hydroxyla
Ayacontens: CMBr8
Ayacon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                              A.Accession: A93202
A.Molecule type: protein
A.Residues: 20-55 <B02>
A.Residues: 20-55 <B02>
A.Residues: 20-55 <B02>
B.Residues: 20-55 <B02>
A.Residues: 20-55 <B02>
A.Residues: 20-55 <B02>
A.Residues: 20-55 <B02>
Biochemistry 10, 2076-2081, 1971
A.Title: Chemical studies on the cyanogen bromide peptides of rat skin collagen. Amino A.Reference number: A90353; MUID:71263178; PMID:4327399
A.Reference number: A90353; MUID:71263178; PMID:4327399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Molecule type: protein
A; Residues: 568-651 scr1>
A; Residues: 568-651 scr1>
A; Residues: 568-651 scr1>
A; Note: this region probably corresponds to positions 949-1032 of the alpha 1(I) chain A; Note: the major antiquence determinant (of neutral salt-extracted rat skin collagen) i FBS Lott: 26, 61-65, 1972
FBS Lett. 26, 61-65, 1972
A; The lett. 26, 61-65, 1972
A; Reference number: A91385; MUD: 73049495; PMID: 4636751
A; Contents: CNBr6
A; Contents: CNBr6
A; CONTENTS

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               of rat skin collagen. The
J. Biol. Chem. 242, 2572-2574, 1967
A, Title: The incomplete hydroxylation of individual prolyl residues in collagen. A, Reference number: A92029; MUID:67165368; PMID:4290711
A, Contents: CNBr2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Molecule type: protein
A; Mesidues: 56-102 < BU1>
A; Experimental source: skin
R; Butler, W.T.
Biochemistry 9, 44-50, 1970
A; Title: Chemical studies on the cyanogen bromide peptides of A; Reference number: A90566; MUID:70085124; PMID:5411206
A; Contents: CNBr5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Accession: A91385
A;Molecule type: protein
A:Residues: 651-671 <5T2>
A;Experimental source: skin
```

```
A; Noucesalous: Asilos
A; Molecule type: protein
A; Residues: 1-19 < RAD:
A; Residues: 1-19 < RAD:
A; Experimental source: Skin
A; Note: the epsilon carbon of Lys-9, by homology with the rat alpha 1(I) chain, is conver
B; Fietzek, P.P.; Kuehn, K.
Bur. J. Biochem. 52, 77-82, 1975
A; Title: The covalent structure of collagen: amino-acid sequence of the cyanogen-bromide
A; Reference number: A91229
A; Reference number: A91229
A; Molecule type: protein
A; Residues: 20-145 < FIES
A; Molecule type: protein
A; Residues: 20-145 < FIES
A; Note: Lys-103 is hydroxylated and binds glucosylgalactose
B; Fietzek, P.P.; Wendt, P.; Kell, I.; Kuehn, K.
FEBS Lett. 26, 74-76, 1972
A; Title: The covalent structure of collagen: amino acid sequence of alphal-CB3 from calf
A; Reference number: A91387; MUID:73049499; PMID:4673951
A; Accession: A91387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   calf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             928
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  808
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          868
                                          448
                                                                                                                                                                                                                     568
                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                   688
                                                                                                                                                                                                                                                                                                                                                                                                                                                360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           collagen alpha 1(I) chain - bovine (tentative sequence) (fragments)
c)Species: Bos primigenius taurus (cattle)
C)Species: 24-Apr-1964 Hsequence revision 31-Dec-1993 #text_change 31-Mar-2000
C,Accession: A91193; A91229; A91387; A91211; A91201; A91200; A43048; A02853
R,Rauterberg, J.; Timpl, R.; Furthmayr, H.
Eur. J. Blochem. 27, 231-237, 1972
A,Title: Structural characterization of N-terminal antigenic determinants in A,Reference number: A91193; MUID:72255334; PMID:4115172
9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSPGSPGPDGKTGPPGPAGEDGRPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                        GRPGDAGPQGKVGPSGAAGEDGRPGPPGPQGARGQPGVMGFPGPKGANGEPGKAGEKGLG
                                                                                                                                                                                                                                                                                                                                                        GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                  GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDAGARGDAGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGPPGARGPSGPE
                          GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                     GPPGERGAPGNRGFPGQDGLAGPKGAPGERGVPGLGGPKGGNGDPGRPGEPGLPGARGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A, Molecule type: protein A, Residues: 146-294 <FI2>A, Experimental source: skin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                 389
                                                                                                                                       449
                                                                                                                                                                                                                            509
                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                    569
                                                                                                                                                                                                                                                                                                                                                               241
                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
                                                                                          61
                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                             원
                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                        유
                                                                                          ò
                                                                                                                           ద
                                                                                                                                                                           ò
                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 10
A40333
Collagen alpha 1'(II) chain precursor - African clawed frog
CiSpecies: Xenopus laevis (African clawed frog)
CiSpecies: Xenopus laevis (African clawed frog)
CiSpecies: Xenopus laevis (African clawed frog)
CiDate: 16-Sep-1992 #sequence_revision 16-Sep-1992 #text_change 16-Jul-1999
CiSpecies: Xenopus laevis (African clawed)
CiSpecies: Xenopus laevis laevis in 16-Sep-1992 #text_change 16-Jul-1999
CiSpecies: Xenopus laevis laevis in 16-Sep-1992 #text_change 16-Jul-1999
CiSpecies: Xenopus laevis l
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ö
                                                                                               ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 685
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           120
                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                    565
                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPCAVGPACKDGEAGAEGPPCPACPACERCEEGPAGSPCFECLPCPACPPCEACKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAPCLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                    445
                                                                                                                                                                                                                                                              GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                   GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                       GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                 506 GPPGERGAPGNRGFPGQDGLAGPKGAPGERGVPGLGGPKGGNGDPGRPGEPGLPGARGLT
                                                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                            GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
         F,1258-1486/Domain: fibrillar collagen carboxyl-terminal homology <FCC>
                                                                                                 ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1492;
                                                    Length 1486;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match

69.4%; Score 2131; DB 2;
Best Local Similarity 70.0%; Pred. No. 1.4e-96;
Matches 381; Conservative 41; Mismatches 122;
                                                    ; Score 2147; DB 1;
; Pred. No. 2.3e-97;
41; Mismatches 120;
                                                      Similarity 70.4%; 3; Conservative 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKEG 544
                                                      Query Match
Best Local Simil
Matches 383; C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           908
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      626
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      746
                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                 446
                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                              999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                     Q
                                                                                                                                                                                                                                                                                                                           $ 6 5 6 5
5 6 5 6 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8 8
                                                                                                                                                                                    g
                                                                                                                                                                                                                                 à
```

and hun

Sep

Fri

534

struct

```
A: Experimental source: placenta

R: Greenspan, D.S.; Lee, S.T.; Lee, B.S.; Hoffman, G.G.
Gene Expr. 1, 29-39, 1991

A: Fixe Homology between alpha2 (V) and alpha1 (III) collagen promoters and evidence for I A: Reference number: A54555; MUD: 92314691; PMID: 1820205

A: Accession: A54555

A: Accession: A54555

A: Molecule type: DNA

A: Residues: 1-32 <GRE>
A: More add A: Residues: Boutillon, M.M.; Berr

Eur. J. Biochem: 221, 987-995, 1994

A: Title: Diversity in the processing events at the N-terminus of type-V collagen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: mRNA
A; Residues: 1003-1034 cRES.
A; Residues: 1003-1034 cRES.
A; Cross-references: GB:MII135; NID:g179693; PIDN:AAA51857.1; PID:g179694
A; Note: part of this sequence were determined by protein sequencing
B; Myers, J.C.; Loidl, H.R.; Seyer, J.M.; Dion, A.S.
J. Biol. Chem. 260, 1121611222, 1995
A; Title: Complete primary structure of the human alpha-2 type V procollagen COOH-terminal
A; Reference number: A25374; MUID:85289337; PMID:2411731
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      related to the major fibrills
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A; Residues: 1002-1226 <RE2>
A; Cross-references: GE:MN0956; NID:g180427; PIDN:AAA52007.1; PID:g180428
A; Across-references: GE:MN0956; NID:g180427; PIDN:AAA52007.1; PID:g180428
A; Note: part of this sequence were determined by protein sequencing
R; Emanuel, B.S.; Cannizzaro, L.A.; Seyer, J.M.; Myers, J.C.
Proc. Natl. Acad. Sci. U.S.A. 82, 3385-3389, 1985
A; Title: Human alpha 1(III) and alpha 2(V) proccollagen genes are located on the long arm
A; Reference number: 159025; MUD:85216505; PMID:3858826
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Cispecies: Homo sapiens (man)
Cispecies: Homo sapiens (man)
Cipecies: Homo sapiens (man)
Cipecies: 31-Jul-1989 #sequence revision 28-Jul-1995 #text_change 31-Dec-2000
Cipate: 31-Jul-1989 #sequence revision 28-Jul-1995 #text_change 31-Dec-2000
Cipate: 31-Jul-1989 #sequence revision 7. Remirez, F.
F. Moodbury, D.; Benson-Chanda, V.; Ramirez, F.
J. Biol. Chem. 264, 2735-2738, 1989
A/Title: AMino-terminal propeptide of human pro-alpha2(V) collagen conforms to the A;Reference number: A31427; MUID:89123368; PMID:2914927
                                                                                                398 GDAGFPGPAGPPGPPGPIGNVGAPGPKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPP 457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2 type V collagen chain.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Molecule type: mRNA
A;Residues: 1-463 <WOO>
A;Cross-references: GB:J04478; NID:g179697; PIDN:AAA51859.1; PID:g179698
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A,Molecule type: mRNA, DNA
A,Residues: 398-1496 <WEI>
A,Residues: 398-1496 <WEI>
A,Cross-references: GB:X04758; NID:g29588; PIDN:CAA28454.1; PID:g1340175
A;Experimental source: rhabdomyosarcoma cell line
R;Myers, J.C.; Loidl, H.R.; Stolle, C.A.; Seyer, J.M.
J, Biol. Chem. 260, 5533-5541, 1985
A;Title: Partial covalent structure of the human alpha 2 type V collagen
A;Reference number: 155239; MUID:85182703; PMID:2985598
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A,Accession: 843643
A,Molecule type: protein
A,Residues: 288-291, 'P',293-294,'X',295-297;606,'X',608-617 <MOR>
R,Weil, D.; Bernard, M.; Gargano, S.; Ramirez, F.
R,Weil, D.; Bernard, M.; Gargano, S.; Ramirez, F.
M.Worleic Andida Res. 15, 181-198, 1987
A,Title: The pro alpha 2 (V) collagen gene is evolutionarily relational A,Reference number: A25874; MUID:87146331; PMID:3029669
                                                                                                                                                                                                                                                                                                                                                                                                                                                         collagen alpha 2(V) chain precursor - human
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Status: translated from GB/EMBL/DDBJ
                                                                                                                                                                                                     544
                                                                                                                                                                                                                                                                   458 GPPGPAGKEG 467
                                                                                                                                                                                                     535 GPPGPAGKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A, Molecule type: mRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ;Accession: A25874
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Accession: I59025
                                                                                                            . q
                                                      ઠે
                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                            A; Experimental source: skin

R; Wendt, P.; Mark, K.V.D.; Rexrodt, F.; Kuehn, K.

Bur. J. Biochem. 30, 169-183, 1972

A; Reference number: A91201; MUID:73042276; PMID:4343808

A; Reference number: A91201; MUID:73042276; PMID:4343808

A; Residues: 563-675 < WEN>
A; Residues: 563-675 < WENS
A; Residues: 563-675 < WENS
A; Reference number: A91200; MUID:73042275; PMID:4343807

A; Reference number: A91200; MUID:73042275; PMID:4343807

A; Residues: 676-758 < FI4>
A; Residues: 676-758 < FI4>
A; Residues: 676-758 < FI4>
A; Residues: 676-758 < Win
A; Note: Pro-726 is the only 3-hydroxyproline and the only hydroxylated proline in positi R; Rutterberg, U; Fietzek, P; Rexrodt, F; Becker, U; Stark, M; Kuehn, K.
FEBS Lett. 21, 75-79, 1972
A; Title: The amino acid sequence of the carboxyterminal nonhelical cross link region of A; Accession: A43048
A; Accession: A43048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A,Residues: 759-779 <RA2>
A,Residues: 759-779 <AR2
C,Comment: Prolines at positions 115, 124, 274, 346, 424, 496, 658, and 670 may be hydrox C,Comment: Prolines in the third position of the tripeptide repeating unit (G-X-Y) are h C,Comment: The order of the eight CNBr peptides in the alpha 1(I) chain of bovine skin C,Comment: The complete chain contains 1052 residues.
C,Comment: The complete chain contains 1052 residues.
C,Superfamily: collagen alpha 1(I) chain; fibrillar collagen carboxyl-terminal homology; C,Reywords: coiled coil; extracellular matrix; glycoprotein; pyroglutamic acid; trimer; F;1/Modified site: pyrrolidone carboxylic acid (Gln) #status experimental
R;Fietzek, P.P.; Rexrodt, F.W.; Hopper, K.E.; Kuehn, K.
Eur. J. Balochem. 38, 36-400, 1973
A;Title: The covalent structure of collagen. 2. The amino-acid sequence of alphal-CB7 fr
A;Reference number: A91211; MUID:74086118; PMID:4359390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    101 ĠWKGHRĠFSĠLDĠAKĠDAĠPAĠPKGEPĠSPĠENĠAPĠQMĠPRGLPĠFPGPKGAAĠEPĠKA 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPSGPEGPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEP 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  415 GAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAK 474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         175 GAKGLTGSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    295 GKPGEEGVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GERGVPGPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAPGSEGAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            51, Indels 39; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 67.6%; Score 2076.5; DB 1; Length 779; Best Local Similarity 78.0%; Pred. No. 3.7e-94; Matches 382; Conservative 18; Mismatches 51; Indels 39;
                                                                                                                                           A;Accession: A91211
A;Molecule type: protein
A;Residues: 295-562 <FI3>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Accession: A43048
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
```

```
polymera
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C.Superfamily: collagen alpha 2(I) chain, fibrillar collagen carboxyl-terminal homology C; Seywords: coiled coil, extracellular matrix; glycoprotein; trimer; triple helix F;1145-1373/Domain: fibrillar collagen carboxyl-terminal homology <FCC>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              pro alpha 2(I) collagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Reference number: A54328; MUID:92084969; PMID:1748823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                480
                                                                                 632
                                                                                                              300
                                                                                                                           GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                     812
                                                                                                                                                                                                                                                                                                            872
                                                                                                                                                                                                                                                                                                                                       481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPP 540
                                                                                                                                                                                              752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                       GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                            GVPGGPGAVGPLGPRGERGNPGERGEPGITGLPGEKGMAGCHGPDGPKGSPGPSGTPGDT
                                                                                                                                                                                                                                         1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPAGPAGPRGEVGLPGLSGPVGPPGNPGTNGLTGAKGATGLPGVAGAPGLPGPRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                           813 GEPGPRGLVGPPGSRGNPGSRGENGPTGAVGFAGPQGSDGQPGVKGEPGEPGDAGSP
                 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
  121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                        GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                          GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 1373;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Status: preliminary; not compared with conceptual translation A;Molecule type: mRNA A;Residues: 1-110 <PH2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          62.4%; Score 1915; DB 1;
64.2%; Pred. No. 3.7e-86;
ive 45; Mismatches 150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         64.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity
Matches 349; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                 541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COL1A2
                                                                                                               241
                                                                                                                                                                     301
                                                                                                                                                                                                 693
                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           61
                                                          181
                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                         임
                                                                                                                                                                                                                                                                                                                                                             g
                       g
                                                        ò
                                                                              g
                                                                                                         ઠે
                                                                                                                                     유
                                                                                                                                                                     Š
                                                                                                                                                                                          셤
                                                                                                                                                                                                                          ઠે
                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                          ઠ
                                                                                                                                                                                                                                                                                                                                       ठ
                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                    A;Accession: A25374
A;Molecule type: mRNA
A;Residues: 127-1417, Tr, 1419-1437, S',1439-1496 <MYE>
A;Molecule type: mRNA
A;Residues: 127-1417, Tr, 1419-1437, S',1439-1496 <MYE>
A;Cross-references: GB:M11718; NID:g180912; PIDN:AA82058.1; PID:g180913
A;Experimental source: normal fibroblasts
R;Teipouras, P.; Schwartz, R.C.; Liddell, A.C.; Salkeld, C.S.; Weil, D.; Ramirez, F.
Genomics 3, 275-277, 1988
A;Title: Genetic distance of two fibrillar collagen loci, COL3A1 and COL5A2, located on A;Reference number: A30017, MUID:89138450; PMID:3224983
A;Accession: A30017
A;Accession: A30017
A;Accession: A30017
A;Accession: A30017
A;Accession: A30017
A;Accession: A30017
A;Cross-references: GB:J03551; NID:g179695; PIDN:AAA51858 1; PID:g179696
A;Cross-references: GB:J03051; NID:g179695; PIDN:AAA51858 1; PID:g179696
A;Croment: Prolines and lysines at the third postition of the tripeptide repeating unit (are 5-hydroxylated and subsequently O-glycosylated.
C;Comment: The amino-terminal propeptide domain appears not to be completely cleaved.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    452
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   396 GPEGPQGQRGETGPPGPVGSPGLPGAIGTDGTPGPKGPTGSPGTSGP---PGSAGPPGSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity 64.0%;
Matches 348; Conservative 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       d
```

12

300 693 753

813 480 873

```
A; Introne: 29/1; 95/3; 112/3; 150/3; 175/3; 193/3; 211/3; 229/3; 247/3; 265/3; 283/3; 298 58/3; 673/3; 706/3; 778/3; 778/3; 796/3; 814/3; 850/3; 868/3; 886/3; 940/3; 976/3; 5. Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxyl-terminal homology; C; Keywords: coiled coil; extracellular matrix.

E;1-24/Domain: signal sequence #status predicted <SIG>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              collagen alpha 1(III) chain precursor - mouse
C;Species: Mus musculus (house mouse)
C;Date: 10-Apr-1996 #sequence revision 19-Apr-1996 #text_change 13-Aug-1999
C;Accession: 559856; 562120; $\frac{3}{16373}$
R;Toman, P.D.; de Crombrugghe, B.
Gene 147, 161-168, 1994
A;Title: The mouse type-III procollagen-encoding gene: genomic cloning and complete DNA: A;Reference number: $59856; MUID:95011609; PMID:7926795
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and IX collagen mRNAs.
                                                                                                                                                                                                                                                  GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                              GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                      874 GPQGLAGSPGPHGPHGVPGLKGGRGTQGPPGATGFPGSAGRVGPPGPAGAPGPAGPAGEP 933
                         574 GNPGVOGPEGKLGPLGAPGEDGRPGPPGSIGIRGOPGSMGVPGPKGSSGDLGKPGEAGNA
                                                                                                                                                             GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE
                                                                                                                                                                                                                                                                                        754 GPPGLQGMPGERGIAGTPGPKGDRGGIGEKGAEGTAGNDGARGLPGPLGPPGPAGLLGAP
                                                                                                                                                                                                                                                                                                                                                                   814 GEPGPRGLVGPPGSRGNPGSRGENGPTGAVGFAGPQGSDGQPGVKGEPGEPGGKGDAGSP
                                                                      GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                 634 GVPGQRGAPGKDGEVGPSGPVGPPGLAGERGEAGPPGPTGFQGLPGPPGPPGEGGKAGDQ
                                                                                                                                                                                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             submitted to the EMBL Data Library, November 1994

A;Reference number: 862120

A;Reference number: 862120

A;Reference number: 862120

A;Rolecule type: DNA

A;Residues: 1-866,'G',868-1464 <TOA>

A;Residues: 1-866,'G',868-1464 <TOA>

A;Cross-references: EMBL:X52046; NID:9575321; PIDN:CAA36279.1; PID:9575322

R;Retsaeranta, M.; Toman, D.; de Crombrugghe, B.; Vuorio, E.

B;chim, B;Ophya; Acta 1089, 241-243, 1991

A;Title: Specific hybridization probes for mouse type I, II, III and IX col

A;Reference number: S16176; MUID:91274355; PMID:2054384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-references: EMBL:X57983; NID:950476; PIDN:CAA41048.1; PID:950477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      F;25-154/Domain: propeptide #status predicted <PRO>F;22-92/Domain: von Willebrand factor type C repeat homology <VWC>F;125-1464/Product: collagen alpha I(III) chain #status predicted <MAT>F;1236-1464/Domain: fibrillar collagen carboxyl-terminal homology <PCC>
  ;
9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 62.1%; Score 1908; DB 2; Length 1464; Similarity 63.3%; Pred. No. 8.5e-86; 61; Conservative 37; Mismatches 158; Indels 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Molecule type: DNA
Residues: 1-1464 <TOM>
Cross-references: EMBL:X52046
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A,Accession: S16373
A,Status: preliminary
A,Molecule type: DNA
A,Residues: 1442-1464 <MET>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             937
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Local Sim
Matches 346;
                                                                                                                                                           301
                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   541
                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             934
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT
                                                                                                          g
                                                                                                                                                                                          ద
                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                     Ор
                                                                                                                                                                                                                                                                                                                                                                      임
                                                                 Š
                                                                                                                                                         ð
                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       procollagen type V alpha 2 - mouse
() Species: Mus musculus (house mouse)
() Species: Mus musculus (house mouse)
() Accession: 149607
() Andrikopoulos, K.; Suzuki, H.R.; Solursh, M.; Ramirez, F.
() Andrikopoulos, K.; Suzuki, H.R.; Solursh, M.; Ramirez, F.
() Andrikopoulos, K.; Suzuki, H.R.; Solursh, M.; Ramirez, F.
() A.; Title: Localization of pro-alpha 2(V) collagen transcripts in the tissues of the development of pro-alpha 2(V) collagen transcripts in the tissues of the development of pro-alpha 2(V) collagen transcripts in the tissues of the development is preliminary; translated from GB/EMBL/DDBJ
A; Molecule type: mRNA
A; Molecule type: mRNA
A; Molecule type: mRNA
A; Molecule type: mRNA
A; Residues: 1-1497 crass
C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C:Superfamily: collagen alpha 1(1) chain; fibrillar collagen carboxyl-terminal homology F;39-98/Domain: von Willebrand factor type C repeat homology <VWC>F;1270-1497/Domain: fibrillar collagen carboxyl-terminal homology <FCC>
                                                                                         459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ô
                                                                                                                                      240
                                                                                                                                                                                519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                                                                                                                                        GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                     579
                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                 669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          759
GAAGATGARGLVGEPGPAGSKGESGNKGEPGSVGAQGPPGPSGEEGKRGSPGEAGSAGPA 399
                                                                                                                                                                                                                                                                                                             GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                         GPPGLRGSPGSRGLPGADGRAGVMGPPGNRGSTGPAGIRGPNGDAGRPGEPGLMGPRGLP
                                                                                                                                                             GSPGNVGPSGKEGPVGLPGIDGRPGPIGPAGPRGEAGNIGFPGPKGPSGDPGKPGERGHP
                                                                                                                                                                                                                                                    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                   GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                    GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 1497;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      62.2%; Score 1910; DB 2; Length 1
63.8%; Pred. No. 6.9e-86;
tive 39; Mismatches 158; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity 63.8%
Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKEG 823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Gene: Col5a-2
                                                                                       400
                                                                                                                                 181
                                                                                                                                                                           460
                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                   520
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  820
                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                               640
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   481
                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                  361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   514
                                        ò
                                                                         8 S
                                                                                                                                                             g
                                                                                                                                                                                                        \delta
                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                        \dot{\delta}
                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                             8 8 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   P S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \rac{1}{2}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
```

5

us-10-658-989a-4.rpr

```
181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGWMGFPGPKGAAGEPGKAGERGVP 240
                                                                                 241 GPPGAVGPAGKDGFAGAEGPPGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                          301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGA---PGDDGAKGDAGAPGAP 357
                                                                                                                                    358 GSEGAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAP 417
                                                                                                                                                             121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                         GPAGKEG 544
                                                                                                                                                                                                                                             896 GAPGKDG 902
                                                                                                                                                                                                                    g
                                   g
                                                 ଧ ଶ
                                                                      ð
                                                                                    8 8 8
                                                                                                                          상
음
                                                                                                                                                   ò
                                                                                                                                                                ద
                                                                                                                                                                               ò
                                                                                                                                                                                       B
                                                                                                                                                                                                     ò
                         ò
```

Search completed: September 24, 2004, 11:11:47 Job time : 22.9509 secs

This Page Blank (uspto)

## GenCore version 5.1.6 Copyright (c) 1993 - 2004 Compugen Ltd.

OM protein - protein search, using sw model

September 24, 2004, 11:06:55 , Search time 13.7264 Seconds (without alignments) 2063.622 Million cell updates/sec Run on:

Title: Perfect score: Sequence:

US-10-658-989A-4 3070 1 GSEGPEGVRGEPGPPGPAGA......PGPSGDAGPRGPPGFAGKEG 544

Scoring table: BLOSUM62 Gapext 0.5

141681 seqs, 52070155 residues Searched:

141681 Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

SwissProt\_42:\* Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

	scripti	homod	Q9xsj7 canis famil	mus n	gall		mus	P02454 rattus norv		bos taı		rattr	homo	พกร ก	bos t		พนธ ก	cani	homo	rana	gallu		bos t	homo	homo	homod	u snw	P13942 homo sapien	mus n	rifti	homo	ᅻ	ascaı	P53420 homo sapien
		t t l t																														į		
SUMMARIES	ID	CA11 HUMAN	CA11 CANFA	CA11 MOUSE	CA11_CHICK		CA12 MOUSE	CA11 RAT	CA11_BOVIN	CA21 BOVIN	CA13_CHICK	CA21_RAT	CA25 HUMAN	CA21 MOUSE	CA13 BOVIN	CA13_HUMAN	CA13 MOUSE	CA21 CANFA	CA21 HUMAN	CA21_RANCA	CA21_CHICK	CA21_ONCMY	CA12_BOVIN	CA15_HUMAN	CA1B_HUMAN	CA35_HUMAN	CA1B_MOUSE	CA2B_HUMAN	CA2B MOUSE	CAFF RIFPA	CAS4_HUMAN	17	24.	CA44_HUMAN
	DB	l d	Н	Н	Н	Н	Н	Н				Н	Н	Н	Н	Н	Н	щ	Н	Н	Н	Н	Н	Н	H	Н	-1	H	-1	Н	н	Н	Н	٦
	Бū	4.6	46	45	LO	41	45	671	^	36	w	37	49	37	9	46	4.6	36	36	35	36	35	74	83	80	74	80	73	73	2	68	94	9	69
ď	Query Match	. 9	ď.	ë	0	ä	Η.	70.1	7.	ω.	۳.	ო	ä	ς.	ď.	ä	ä	ä	Η.	φ.	φ.	ω.	8	7.	۲.	7.	ġ.	•	ė.	'n.	'n	٠	4.	•
	Score	2966	2940	2857	2775	2202	2192	2151	2076.5	1949	1934.5	1934	1921.5	Н	1905.5	1901	1899	1898	1880	1834.5	1822	1789	1496	1454.5	1449	1447	Н	N	41	1410	Н	1375.5	Н	1357.5
	Result No.	1 11	(7)	m	4	2	9	7	00	σı	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	56	27	28	29	30	31	32	33

Q28083 bos taurus Q01955 homo sapien	Q07092 homo sapien P02462 homo sapien	P17140 caenorhabdi P02463 mus musculu	P08572 homo sapien	Q28247 canis famil	Q14050 homo sapien	Q14993 homo sapien	Q05722 mus musculu
CA1B_BOVIN	CA1F_HUMAN CA14_HUMAN	CA24 CAEEL	CA24_HUMAN	CAS4_CANFA	CA39_HUMAN	CA11_HUMAN	CA19_MOUSE
	пп	-1 -1	Hr	4	Н	Н	Н
911	1603 1669	1758	1712	754	684	1143	921
44.2	43.6	42.7	41.9	41.7	41.6	41.6	41.6
1356	1339.5 1320	1310.5	1286.5	1279.5	1277	1276.5	1276
3.4 3.5	36	8 6 7 8	4.0	1 4	43	44	4.5

## ALIGNMENTS

CA11_HU	MAN CONSTRAIN CONSTRAINS
A P	12; O14037; O15176;
Ę	(Rel. 01, Creat
E E	sednence up
בן בן בן	(Kel. 42, Last ha 1(T) chain r
3 8	diplication
SO	
8	Chordata; Craniata; Vertebrata; E
S 8	Mammalla; Eutherla; Frimates; Catarrhin; Hominidae; Homo.
Y Z	NCBI TAXID=YOUD;
꾟	SEQUENCE OF 1-472 FROM N.A.
	Tromp G., Kuivaniemi H., Stacey A., Shikata H., Baldwin C.T.,
	"Structure of a full-length cDNA clone for the prepro alpha 1(1)
	chain of human type I procellagen.";
7 K	BIOCNEM. U. 253:919-922(1988).
ž 0	CACITANCE OF 1-191 FROM N A
X	
RA	
Z	filliams C., Ramirez F.;
RT	lagen gene struc
RT	
RL	Nature 310:337-340(1984).
RN	[3]
RP.	SEQUENCE OF 162-301.
ည္က	TISSUE=Skin;
RX	MEDLINE=71038625; PubMed=5529814;
Z I	
RT	of the c
RT	the alpha 1 and alpha 2 chains of human skin collagen.";
RĽ	Biochemistry 9:4699-4706(1970).
RN	
유	SEQUENCE OF 263-268.
RG C	TISSUE=Skin;
X;	
KA I	., cunningnam
¥ £	"A comparative study of glycopeptides defived from selected
¥ (	or the carponydiate in tibit
RI	formation.";
2	J. Biol. Chem. 245:5042-5048(1970).
Z I	[5]
24 £	SEQUENCE OF 425-1464 FROM N.A.
<b>4</b> 6	10 C
£ £	c., namirez :., hinemeriy n
5 E	ntary decaynibonicleic act
1 E	chain of h
E	that are conserved during evolution ".
Z Z	L3-5223 (1983).
2 2	
į	

24 11:45:40 2004

Sep

```
[25]
VARIANT OI-II CYS-422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Clin.
  [8]
SEQUENCE OF 1-34 FROM N.A.
SEQUENCE OF 1-34 FROM N.A.
MEDLINE=65130970; PubMed=2857713;
Chu M.-L., de Wet W.J., Bernard M.P., Ramirez F.;
Chu M.-L., de Wet W.J., Bernard M.P., Ramirez F.;
"Fine extructural analysis of the human pro-alpha 1 (I) collagen gene.
Promotes structure, Alul repeats, and polymorphic transcripts.";
J. Biol. Chem. 260:2315-2320(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 1-44 FROM N.A.
MEDLINE-88033098; PubMed-2822714;
Rossouw C.M.S., Vergeer W.P., du Plooy S.J., Bernard M.P., Ramirez F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VARIANT OI-II ARG-569.
MEDLINE=87222295; PubMed=3108247;
Bateman J.F., Chan D., Walkers I.D., Rogers J.G., Cole W.G.;
Bateman J.F., Chan Dosteogenesis imperfecta due to the substitution of arginine for glycine at residue 391 of the alpha 1(I) chain of type I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDIANE 31184577; PubMed=2010058; Kuivaniemi H., Tromp G., Prockop D.J.; Mutations in collagen genes: causes of rare and some common diseases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   REVIEW ON VARIANTS.
MEDLINE=97255959; PubMed=9101290;
Kuivaniemi H., Tromp G., Prockop D.J.;
"Mutations in fibrillar collagens (types I, II, III, and XI), fibril-
associated collagen (type IX), and network-forming collagen (type X)
cause a spectrum of diseases of bone, cartilage, and blood vessels.";
                                                                                                                                                                   SEQUENCE OF 1-34 FROM N.A.

MEDLINE-88097389; PubMed=3480516;

Bornstein P., McKay J., Morishima J.K., Devarayalu S., Gelinas R.E.;

"Regulatory elements in the first intron contribute to
transcriptional control of the human alpha 1(1) collagen gene.";

Proc. Natl. Acad. Sci. U.S.A. 84:8869-8873(1987).
                                                           Maekelae J.K., Raassina M., Virta A., Vuorio E.;
"Human pro alpha 1(I) collagen: cDNA sequence for the C-propeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                phenotype.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "DNA sequences in the first intron of the human pro-alpha 1(I) collagen gene enhance transcription."; J. Biol. Chem. 262:15151-15157(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT OI-II CYS-1166.
MEDLINE=66287390; PubMed=3016737;
Cohn D.H., Byers P.H., Steinmann B., Gelinas R.E.;
"Lethal osteogenesis imperfecta resulting from a single schange in one human pro alpha i(1) collagen allele.";
Proc. Natl. Acad. Sci. U.S.A. 83:6045-6047(1986).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mutation to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "The human type I collagen mutation database.";
Nucleic Acids Res. 25:181-187(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=91374476; PubMed=1895312;
Pyers P.H., Wallis G.A., Willing M.C.;
"Osteogenesis imperfecta: translation of
J. Med. Genet. 28:433-442(1991).
                                                                                                                              Nucleic Acids Res. 16:349-349(1988)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Biol. Chem. 262:7021-7027(1987)
                                         MEDLINE=88124208; PubMed=3340531;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=97169389; PubMed=9016532;
OF 1229-1454 FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mutat. 9:300-315(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            in humans.";
FASEB J. 5:2052-2060(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                REVIEW ON OI VARIANTS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            REVIEW ON OI VARIANTS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VARIANT OI-II CYS-926
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REVIEW ON VARIANTS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Dalgleish R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           de Wet W.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       collagen."
REFERRAX REFERRA REFER
```

```
MEDLINE=88033031; PubMed=3667599;
Wogel B.E., Minor R.R., Freund M., Prockop D.J.;
Wogel B.E., Minor R.R., Freund M., Prockop D.J.;
The alphal chain to cysteine and destabilizes the triple helix in a lethal variant of osteogenesis imperfecta.";
T. Biol. Chem. 262:14737-14744(1987).

WARIANT OT-II ARG-842.

MEDLINE=88298828; PubMed=3403550;
MEDLINE=88298828; PubMed=3403550;
MEDLINE=8829828; PubMed=340350;
MEDLINE=8829828; PubMed=3403550;
MEDLINE=8829828; PubMed=3403550;
MEDLINE=8829828; PubMed=3403550;
MEDLINE=8829828; PubMed=3403550;
MEDLINE=8829828; PubMed=3403550;
MEDLINE=8829828; PubMed=340350;
MEDLINE=8829828; PubMed=340350;
MEDLINE=8829828828;
MEDLINE=8829828828;
MEDLINE=8829828828;
MEDLINE=8829828288288;
MEDLIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-89308591; PubMed-2745420;
Marini J.C., Grange D.K., Gottesman G.S., Lewis M.B., Koeplin D.A.;
"Osteogenesis imperfecta type IV. Detection of a point mutation in one alpha I(I) collagen allele (COLLAI) by RNA/RNA hybrid analysis.";
J. Biol. Chem. 264:11893-11900(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ρχο
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=90062068; PubMed=2511192;
Pack M., Constantinou C.D., Ralia K., Nielsen K.B., Prockop D.J.;
Pack M., Constantinou C.D., Ralia K., Nielsen 844 in a severe
variant of osteogenesis imperfecta minimally destabilizes the triple
helix of type I procollagen. The effects of glycine substitutions on
thermal stability are either position of amino acid specific.";
J. Biol. Chem. 264:19699(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=89255493; PubMed=2470760;
Patterson B., Smiley B., Bonadio J.;
"RNA sequence analysis of a perinatal lethal osteogenesis imperfecta
mutation..;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT OI-II CYS-1082.
MEDLINE=89109573; PubMed=2913053;
CODSTANTINE-99109573; PubMed=2913053;
"A lethal variant of osteogenesis imperfecta has a single base mutaction that substitutes cysteine for glycine 904 of the alpha 1(I) entation that substitutes cysteine for glycine 904 of the alpha 1(I) chain of type I procollegen. The asymptomatic mother has an unidentified mutation producing an overmodified and unstable type I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WARTANT OI CYS-1195.
MEDLINE-89218628; PubMed=2244312;
Labhard M.E., Witcz M.K., Pope F.M., Nicholls A.C., Hollister D.W.;
"A cysteine for glydine substitution at position 1017 in an alpha 1(1) chain of type I collagen in a patient with mild dominantly inherited osteogenesis imperfecta.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=90009313; PubMed=2794057; Starman B.J., Eyre D., Charbonneau H., Harrylock M., Weis M.A., Weiss L., Graham J.M., Byers P.H.; Osteogenesis imperfecta. The position of substitution for glycine cysteine in the triple helical domain of the pro alpha I(I) chains type I collagen determines the clinical phenotype.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VARIANTS OI-II ALA-1106; VAL-1151; ARG-1154 AND VAL-1184.
MEDLINE-89380165; PubMed=2777764;
Lamande S.R., Dahl H.-H.M., Cole W.G., Bateman J.P.;
"Characterization of point mutations in the collagen COLIA1 and COLIA2 genes causing lethal perinatal osteogenesis imperfecta.";
J. Biol. Chem. 264:15809-15812(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANTS OI CYS-272; CYS-704 AND CYS-896.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         J. Biol. Chem. 264:10083-10087(1989)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            84:1206-1214(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Clin. Invest. 83:574-584(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Biol. Med. 5:197-207 (1988)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT OI-IV SER-1010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VARIANT OI-II VAL-434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VARIANT OI SER-1022.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           procollagen."
```

```
DISEASE: Defects in COLIA1 are a cause
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         쉱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ઠે
ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   쉱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGARGEPGDAGAKGDAGAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPA 540
                                                                                                          541
                                                                                                                                                                                                                                                                                                        GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       782 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP 841
                                                                                                                                                            GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                481
                                                                                                                                                                                                                                   GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                  GPPGAVGPACKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                       GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ 721
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPP 901
                                                                                                                                                                                 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKKGARGEPGFTGLP
                                                                                                                                                                                                                                                        482 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGFAGFRGEAGRPGEAGLPGAKGLT
                                                                                      1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COLIAI.
Conis familiaris (Dog).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi;
Mammalia; Eutheria; Carnivora; Fissipedia; Canidae; Canis.
                                                    ö
                   Length 1464;
                                                  3; Indels
               96.6%; Score 2966; DB 1; 95.6%; Pred. No. 2.5e-113; ive 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
15-MAR-2004 (Rel. 43, Last annotation update)
Collagen alpha 1(I) chain precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT; 1460 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A., AND VARIANT OI ALA-208
                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STANDARD;
                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKEG 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 2
CA11 CANFA
AC 09XSJ7;
DT 30-MAY-2000
DT 30-MAY-2000
DT 15-MAR-2004
DB COLlagen alp
COLCIA
SCOLIA
OC EUKATYCES;
NC CANIS famili
OC MAMMAIS;
NC CANIS famili
COL NOBL TAXID=9
RN (12)
RN REDURE FRO
RC TISSUE-SKIN;
RX MEDLINE-2102
RX 
                                                    520;
             Query Match
Best Local S:
Matches 520
                                                                                                                                                                                                                                                                                                                                                                                                                    602 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 722 (
                                                                                                                         362
                                                                                                                                                                                                422
                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            662
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                842
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541
                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                       g
                                                                                                                                                                                     යි. දි
                                                                                                                                                                                                                                                            8 8
                                                                                                                                                                                                                                                                                                                                                                        \dot{\delta}
                                                                                                                                                                                                                                                                                                                                                                                                           ď
                                                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   8
                                                                                                                                                            ò
```

•1•

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce) or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  477
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         597
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       598 GPPGAVGPAGKDGEAGAQGPPGPAGFAGERGEQGPAGSPGFQGLPGPAGPGEAGKPGEQ 657
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         717
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241 GPPGAVGPAGKDGEAGAEGFPGPAGPAGERGEEGPAGSPGFEGLPGFAGFPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    538 GSPGSPGPDGKTGPPGPAGDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       478 GPPGERGGPGSRGFPGADGVAGPKGFAGERGSPGPAGPKGSPGEAGRPGEAGLPBAKKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
osteogenesis imperfecta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AF153062; AAD34619.1; -.

RICTPEO; IPR008161; C1g helix.

RICTPEO; IPR008161; C1g helix.

RICTPEO; IPR008161; C1g helix.

RICTPEO; IPR00181; Fib_collagen_C.

RICTPEO; IPR0010085; Fib_collagen_C.

RICTPEO; IPR00100007; VWF_C.

REAM; PF011391; Collagen; 18.

PF000000001; C1g_helix, 2.

REAM; SMO018; COLFFI_1.

RART; SM0018; COLFFI_1.

RART; RARTHANIAL.

RARDHYD 1361 1361 N-LINACHENT SITE (POTENTIAL).

RARDHYD 1361 1361 N-LINACHENT COLFFI ROTENTIAL).

RARDHYD 1361 1361 N-LINACHENT COLFFI ROTENTIAL).

RARDHYD 208 208

SEQUENCE 1460 AA; 138762 MW; 5883674D28570697 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 95.8%; Score 2940; DB 1; Length 1460; Best Local Similarity 94.3%; Pred. No. 2.8e-112; Matches 513; Conservative 24; Mismatches 7; Indels 0
οţ
                                                                -!- SIMILARITY: Contains 1 VWFC domain.
```

a

8

셤

ò

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this etatement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               531 GSPGSPGPDGKTGPPGPAGQDGRPGPAGARGQAGVMGFPGPKGTAGEPGKAGERGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AMINO-TERMINAL PROPEPTIDE.
COLLAGEN ALPHA 1 (1) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE.
VWFC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        19; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                93.1%; Score 2857; DB 1
91.4%; Pred. No. 6e-109;
iive 28; Mismatches 12
                                                                                                                                                                                                                                                                                                                EMBL; K03031; AAA7332.1; JOINED.
EMBL; K03033; AAA7332.1; JOINED.
EMBL; K03034; AAA7332.1; JOINED.
EMBL; K03034; AAA7332.1; JOINED.
EMBL; K03035; AAA7332.1; JOINED.
PIR; S57243; S21626.
MGD; MGI:88467; Collal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            InterPro; IPRO08161; Clg_helix.
InterPro; IPRO08166; Collagen.
InterPro; IPRO00865; Fib collagen.
InterPro; IPRO02181; Fibrinogen_C.
                                                                                                                                                                                                                 EMBL, M17491, AAA37334.1, ...
EMBL, X06753, CAA29927.1; ...
EMBL, K03036, AAA37332.1, ...
EMBL, K03029, AAA37332.1, JOINED.
EMBL, K03030, AAA37332.1, JOINED.
                                                                                                                                                          EMBL; U08020; AAA88912.1; -. EMBL; X15896; CAA33904.1; -.
                                                                                                                                                                                                M14423; AAA37333.1; -. M17491; AAA37334.1; -. X06753; CAA29927.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local Similarity 91.4 Matches 497; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             151
1207
1453
167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11181
1207
56
1354
736
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1084
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1208
1208
1208
1152
1182
1354
1450
1450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DOMAIN
CARBOHYD
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PROPEP
CHAIN
PROPEP
DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DOMAIN
                                                                                                                                                                                                  EMBL;
    ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ઠે
                                                                                                 540
                                                           837
                                                                                                                                         897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P EXCURNCE OF 1442-1453 FROM N.A.

P SEQUENCE OF 1442-1453 FROM N.A.

MODALINE=88124276, PubMed=3140560,

MODALINE=88124276, PubMed=3140560,

MODALINE=88124276, PubMed=3140560,

R Two mRNAs of mouse pro alpha 1(1) collagen gene differ in the size of the mouse and a collagen is a member of group I collagen

C -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen).

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen).

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen is a member of group I collagen

CC -- FUNCTION: Type I collagen
                                                                                                                        838 GPAGPTGPPGPIGNVGAPGPKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA
                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                            GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGPPGAAGRVGPPGPSGDAGPPGPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=FVB/N;
MEDITE==663340; PubMed=8535610;
Li S.W., Khillan J., Prockop D.J.;
"The complete cDNA coding sequence for the mouse pro alpha 1(1) chain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 735-1130 FROM N.A.
MEDLINE-83141374; PubMed-6298597;
MORSON J.M., Friedman J., McCarthy B.J.;
"DNA sequence analysis of a mouse pro alpha 1 (I) procollagen gene:
evidence for a mouse B1 element within the gene.";
MOI. Cell. Biol. 2:1362-1371(1982).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -!- PTM: Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mus musculus (Mouse).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Monson J.M., McCarthy B.J.; "Identification of a Balb/c mouse pro alpha 1(I) procollagen gene: evidence for insertions or deletions in gene coding sequences."; DNA 1:59-69(1981).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDINE=86137403, PubMed=3841523, French B.T., Lee W.-H., Maul G.G.; "Nucleotide sequence of a cDNA clone for mouse pro alpha 1(I)
                                                                                                                                                                                                                                                                                                                  CA11 MOUSE STANDARD; PRT; 1453 AA. P1087; 066635; Ceated) U-UUL-1989 (Rel. 11, Created) 01-NOV-1997 (Rel. 35, Last sequence update) 28-FEB-2003 (Rel. 41, Last annotation update) Collagen albha 1(I) chain precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 735-878 AND 1005-1058 FROM N.A.
MEDLINE=83157109; PubMed=6219867;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 of type I procollagen.";
Matrix Biol. 14:593-595(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 518-1128 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      collagen protein.";
Gene 39:311-312(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                             541 GKEG 544
                                                                                                                                                                                                                     898 GKEG 901
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=10090;
                                                                                                 181
```

ö 410 120 180 530 470 9 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 411 GPSGPPGPKGNSGEPGAPGNKGDTGAKGEPGATGVQGPPGPAGEEGKRGARGEPGPSGLP 121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT Gaps 181 TRIPLE-HELICAL REGION.
107 NONHELICAL REGION (C-TERMINAL).
184 N-LINKED (GLCNAC. .) (POTENTIAL).
185 CELL ATTACHMENT SITE (POTENTIAL).
186 CELL ATTACHMENT SITE (POTENTIAL).
187 CELL ATTACHMENT SITE (POTENTIAL).
188 CELL ATTACHMENT SITE (POTENTIAL).
189 A -> V (IN REF. 5).
137944 MM; 38802ES35DF81808 CRC64; InterProj introductor; Figure 2.
InterProj introductor; VWF C.
Pfam; PF01410; CoLF1; 1.
Prom; PF01391; Collagen; 18.
Probom; PD002078; Fib\_collagen\_C; 1.
Probom; PD002078; Fib\_collagen\_C; 1.
Probom; PN0318; COLF1; 1.
PROSTE; PS01208; VWFC\_1; 1.
PROSTE; PS01208; VWFC\_1; 1.
PROSTE; PS01208; VWFC\_2; 1.
Bxtracellular matrix; Connective tissue; Repeat; Hydroxylation; Glycoprotein; Collagen; Signal. ö DB 1; Length 1453; NONHELICAL REGION (N-TERMINAL)

830 GPACPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPPGPPGADGAPGDDGAKGDAGAPGAPGSE 360 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420 Gallus gallus (Chicken). Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Archosauria; Aves; Neognathae; Galliformes; Phasianidae; Phasianinae; end the carboxyterminus MEDINE=82231995; PubMed=7093229; Highberger J.H., Corbett C., Dixit S.N., Yu W., Seyer J.M., Kang A.H., Gross J.; And A.H., Gross J.; Ramino acid sequence of chick skin collagen alpha 1(I)-CBB and the complete primary structure of the helical portion of the chick skin collagen alpha 1(I) chain."; Biochemistry 21:2048-2055(1982). SEQUENCE OF 1-153 FROM N.A.
MEDLINE-88056316; PubMed=3678834;
Finer M.H., Boedtker H., Doty P.;
Foner m.H., Boedtker H., Doty P.;
construction and characterization of cDNA clones encoding the 5'
of the chicken pro alpha 1(I) collagen mRNA."; SEQUENCE OF 1-144 FROM N.A.

MEDLINE=88007542; PubMed=2820966;

Finer M.H., Aho S., Gerstenfeld i.C., Boedtker H., Doty P.;

"Unusual DNA sequences located within the promoter region and the first intron of the chicken pro-alpha 1(1) collagen gene.";

J. Biol. Chem. 262:13323-13332(1987). SEQUENCE OF 1200-1205.
MEDLINE=72243016; PubMed=5047697;
Eyre D.R., Glimcher M.J.;
eridence for a previously undetected sequence at
of the alpha 1 chain of chicken bone collagen.";
Blochem. Biophys. Res. Commun. 48:720-726(1972). 21-JUL-1986 (Rel. 01, Created) 01-007-1989 (Rel. 12, Last sequence update) 01-007-2003 (Rel. 42, Last annotation update) collagen alpha 1(1) chain precursor. PRT; 1453 AA. SEQUENCE OF 981-1453 FROM N.A. MEDLINE=81160715; PubMed=6927845; Fuller F., Boedtker H.; STANDARD; SEQUENCE OF 152-1187. GKEG 544 GKEG 894 Gallus. NCBI\_TaxID=9031; CHICK 711 771 591 301 361 481 831 541 421 CA11 CH P02457; RESULT 4
CALL CHICK
ID \_\_CHICK
ID \_\_CHICK
ID \_\_CALL
DT \_\_COLTUL
DT à 음 8 8 ò 8 à 원 8 6

4004

04.04.11

# V

o C

7 1 1

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its modified ann-profit institutions as long as its content is in no way modified and instatement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@lsb-sib.ch).
                                                                MEDINE=80134546; PubMed=6987088;

MEDINE=80134546; PubMed=6987088;

MEDINE=80134546; PubMed=6987088;

A Showatter A.M., Pesciotta D.M., Eikenberry E.F., Yamamoto T.,

Pastan I., Decrombrugghe B.M.;

"Nucleotide sequence of a collagen cDNA-fragment coding for the carboxyl end of pro alpha I(I)-chains.";

"This carboxyl end of pro alpha I(I)-chains.";

"It carboxyl end of pro alpha I(I) chains.";

"It carboxyl end of proline in position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains. Proline residues at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the hydroxylated proline in position X.

"It carboxylated proline in position X.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
"Sequence determination and analysis of the 3' region of chicken proalpha 1(I) and pro-alpha 2(I) collagen messenger ribonucleic acids including the carboxy-terminal propeptide sequences.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 1453;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WWIC.

PYRROLIDONE CARBOXYLIC ACID.

HYDROXYLATION (POTENTIAL).

HYDROXYLATION (POTENTIAL).

HYDROXYLATION (POTENTIAL).

HYDROXYLATION (POTENTIAL).

HYDROXYLATION.

F -> L (IN REF. 5).

Q -> L (IN REF. 6).

WW; 3EC6152134271F4D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AMINO-TERMINAL PROPEPTIDE.
COLLAGEN ALPHA 1(I) CHAIN.
C-TERMINAL PROPEPTIDE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   90.4%; Score 2775; DB 1;
89.0%; Pred. No. 1.2e-105;
tive 28; Mismatches 32;
                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; M17839; AAA48704.1; -.
EMBL; M17838; AAA48704.1; JOINED.
EMBL; VO0401; CAAZ3695.1; -.
EMBL; M10571; AAA48671.1; ALT_SEQ.
EMBL; M17607; AAA48672.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1441
A: 137789 h
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  151
1205
14505
1453
152
254
254
1008
11097
11153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  254
851
1081
1097
1153
1187
1441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Simi
Matches 484;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOD_RES
MOD_RES
MOD_RES
MOD_RES
MOD_RES
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHAIN
PROPEP
DOMAIN
```

ö

```
SEQUENCE OF 963-1418 FROM N.A.
MEDLINE=85190534; PubMed=3857598;
                                                                                                                                                                                                                                                                                                                                                                                                                                             FASEB J. 5:2052-2060(1991).
                                    (COL2A1)
                                                                                        /uorio E.;
                                                                                                                                                                                                                                                                                                                                                                                                                                     humans.
                                     gene
                                                                                                                                                                                                                                                                                                                                                                                                                                     in
 180
                                                                                              530
                                                                                                               240
                590
                                                                                                                                                  300
                                                                                                                                                                   650
                                                                                                                                                                                    360
                                                                                                                                                                                                     710
                                          GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                     GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                        770
                                                                                                                                                                                                                                                       GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                          830
                                                                                                                                                                                                                                                                                           540
                                                                                                                                                                                                                                                                                                   GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                      181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                               241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                         GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                              531 GSPGSPGPDGKTGPPGPAGQDGRPGPAGPPGARGQAGVMGFPGPKGAAGEPGKPGERGAP
                                                                                                                                                                                  GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                        771 GEAGPPGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGETGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                        481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
MEDLINE=90067946; PubMed=2587267;
Su M.W., Lee B., Ramirez F., Machado M., Horton W.;
"Nucleotide sequence of the full length cDNA encoding for human type
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                       21-JUL-1986 (Rel. 01, Created)
01-JAN-1990 (Rel. 13, Last sequence update)
15-MAR-2004 (Rel. 43, Last annotation update)
Collagen alpha 1(II) chain precursor [Contains: Chondrocalcin]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 1-28 FROM N.A.
MEDLINE=87031574; PubMed=3021582;
Nunez A.M., Kohno K., Martin G.R., Yamada Y.;
"Promoter region of the human pro-alpha 1(II)-collagen gene.";
Gene 44:11-16(1986).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ramirez F.;
Submitted (DEC-1988) to the EMBL/GenBank/DDBJ databases
[4]
                                                                                                                                                                                                                                                                                                                                                                                         PRT; 1418 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                II procollagen.";
Nucleic Acids Res. 17:9473-9473(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 432-1145 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                        STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                            541 GKEG 544
                                                                                                                                                                                                                                                                                                                                            GKZG 894
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                       CA12 HUMAN
P02458;
                                                                                                                                                                                                                    361 (
                                                                           121
                                          61
                                                                                                                                                                                  301
                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                            891
                                                                                                                                                                                                                                                                                                                                                                              HUMAN
                                                                                                                                                                                                                                                                                                                                                                    RESULT 5
                                                                                                                                                                                                                                                                                                                                                                              g
                                                    d
                                                                     ò
                                                                                         рр
                                                                                                                           g
                                                                                                                                                                                                g
                                        ò
                                                                                                       ò
                                                                                                                                               δ
                                                                                                                                                               d
                                                                                                                                                                             ò
                                                                                                                                                                                                                    ઠે
                                                                                                                                                                                                                                  qq
                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                       Db
                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                         g
```

```
SEQUENCE OF 1227-1289 FROM N.A.
MEDIATE=86104139; Pubmed=3002437;
Munez A.M., Francomano C., Young M.F., Martin G.R., Yamada Y.;
"Isolation and partial characterization of genomic clones coding for a human pro-alpha 1 (II) collagen chain and demonstration of restriction fragment length polymorphism at the 3' end of the gene.";
Biochemistry 24:6343-6348(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | [11]
REVIEW ON VARIANTS.

MEDLINE=97255959; PubMed=9101290;

Xuivaniemi H., Tromp G., Prockop D.J.;

Xuivaniemi H., Tromp G., Prockop E.J.;

Xuivaniemi H., Tromp G., Prockop D.J.;

Whatations in fibrillar collagens (types I, II, III, and XI), fibril-
associated collagen (type IX), and network-forming collagen (type X)
associated collagen (type IX), and network-forming collagen (type X)
cause a spectrum of diseases of bone, cartilage, and blood vessels.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     οţ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kuivaniemi H., Tromp G., Prockop D.J.; "Mutations in collagen genes: causes of rare and some common diseases
Cheah K.S.E., Stoker N.G., Griffin J.R., Grosveld F.G., Solomon E., "Identification and characterization of the human type II collagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 1106-1418 FROM N.A.
MEDLINE=88067771; PubMed=2825137;
Elima K., Vuorio T., Vuorio E.;
"Determination of the single polyadenylation site of the human pro alpha 1(II) collagen gene.";
Nucleic Acids Res. 15:9499-9504(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE OF 35-167 FROM N.A.
MEDILINE-89231118; PubMed=2714801;
Su M.W., Benson-Chanda V., Vissing H., Ramirez F.;
"Organization of the exons coding for pro alpha 1(II) collagen N-propertide confirms a distinct evolutionary history of this domain
                                                                                                                                                                                                                                                                                                                                                                 Η
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Glycine to serine substitution in the triple helical domain of prapha ! (I) collagen results in a lethal perinatal form of short-limbed dwarfism.";
                                                                                                                                                                                                                                                                                                                                                     "Construction and identification of a cDNA clone for human type procollagen mRNA.";
Biochem. J. 229:183-188(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Strom C.M., Upholt W.B.; "Isolation and characterization of genomic clones corresponding the human type II procollagen gene."; Nucleic Acids Res. 12:1025-1038(1984).
                                                                                                                                                                                                                                                                                      <u>ن</u>
                                                                                                                                                         [5]
SEQUENCE OF 1120-1398 FROM N.A.
SEQUEINE=85306861; PubMed=3940017;
Elima K., Maekelae J.K., Vuorio T., Kauppinen S., Knowles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT SER-1074.
MEDLINE=90036909; PubMed=2572591;
Vissing H., D'Alessio M., Lee B., Ramirez F., Godfrey M., Hollister D.W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE-89266907; PubMed-2543071;
Lee B., Vissing H., Ramirez F., Rogers D., Rimoin D.;
"Identification of the molecular defect in a family with
                                                                                                                    Proc. Natl. Acad. Sci. U.S.A. 82:2555-2559(1985)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Biol. Chem. 264:18265-18267(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT SEDC 1095-GLY--TYR-1330 DEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 1176-1226 FROM N.A. MEDLINE=84118798; PubMed=6320112;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REVIEW ON VARIANTS.
MEDLINE=91184577; Pubmed=2010058;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      the fibrillar collagen genes.";
Genomics 4:438-441(1989).
```

```
RESULT 6
CA12 MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Koerkkoo J., Ritvaniemi P., Haataja L., Kaeaeriaeinen H.,
Kivirikkoo K.I., Prockop D.J., Ala-Kokko L.;
"Mutation in type II procollagen (COL2A1) that substitutes aspartate
for glycine alpha I.67 and that causes cataracts and retinal
detachment: evidence for molecular heterogeneity in the Wagner
syndrome and the Stickler syndrome (arthro-ophthalmopathy).";
Am. J. Hum. Genet. 53:55-61(1993).
                                                                                                                                                                                                                                                                                                                                                                   VARIANT OSTECARTHRITIS CYS-650.
VARIANT OSTECARTHRITIS CYS-650.

ByTE D.R., Weis M.A., Moskowitz R.W.;

Eyre D.R., Weis M.A., Moskowitz R.W.;

"Cartilage expression of a type II collagen mutation in an inherited form of osteoarthritis associated with a mild chondrodysplasia.";

J. Clin. Invest. 87:357-361(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Variant Hypochondrogenesis Ser-705.
MEDLINE=92262484; PubMed=13.74906;
Horton W.A., Machado M.A., Ellard J., Campbell D., Bartley J.,
Ramiroz F., Vitale E., Lee B.;
"Characterization of a type II. collagen gene (COL2A1) mutation
identified in cultured chondrocytes from human hypochondrogenesis.";
Proc. Natl. Acad. Sci. U.S.A. 89:4583-4587(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H
                                                                                                                                                                                                                                                           Bateman J.F., Hannagan M., Chan D., Cole W.G., "Characterization of a type I collagen alpha 2(I) glycine-586 to valine substitution in osteogenesis imperfecta type IV. Detection of the mutation and prenatal diagnosis by a chemical cleavage method."; Biochem. J. 276:765-770(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             transcribes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VARIANT SEMD CYS-840.

Tiller G.B., Weis M.A., Lachman R.S., Cohn D.H., Rimoin D.L.,

Tiller G.B., Weis M.A., Lachman R.S., Cohn D.H., Rimoin D.L.,

Byre D.R.;

"A dominant mutation in the type II collagen gene (COL2A1) produces
spondyloepimeraphyseal dysplasia (SEMD), Strudwick type.";

Am. J. Hum. Genet. 53:A209-A209(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            [22]
VARIANT SEMD ARG-285.
MEDLINE=93252400; PubMed=8486375;
Vikkula M., Ritvaniemi P., Vuorio A.F., Kaitila I., Ala-Kokko L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=93054548; PubMed=1429602; Bogaert R., Tiller G.E., Wies M.A., Gruber H.E., Rimoin D.L., Cohn D.H., Byre D.R.; Man amino acid substitution (G1y853-->Glu) in the collagen alpha 1(II) chain produces hypochondrogenesis."; J. Biol. Chem. 267:22522-22526(1992).
                            VARIANT OSTEOARTHRITIS CYS-650.
WEDLINE=90370826; PubMed=1975693;
Ala-Kokko L., Baldwin C.T., Moskwitz R.W., Prockop D.J.;
Ala-Kokko L., Baldwin C.T., Moskwitz R.W., Prockop D.J.;
Single base mutation in the type II procollagen gene (COL2AI)
cause of primary osteoarthritis associated with a mild
chondrodysplasia.";
Proc. Natl. Acad. Sci. U.S.A. 87:6565-6568(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "A mutation in the amino-terminal end of the triple helix of collagen causing severe osteochondrodysplasia."; Genomics 16:282-285(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT OSTEOARTHRITIS CYS-650.
MEDLINE=91282819; PubMed=8507190;
Holderbaum D., Malemud C.J., Moskowitz R.W., Haggi T.W.;
"Human cartilage from late stage familial osteoarthritis tran"Human cartilage from RNA encoding a cysteine in position 519.";
Hype II collagen mRNA encoding a cysteine in position 519.";
Biochem. Biophys. Res. Commun. 192:1169-1174(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT HYPOCHONDROGENESIS GLU-984.
                                                                                                                                                                                                                        VARIANT OI-IV VAL-717.
MEDLINE=91291136; PubMed=2064612;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=93304428; PubMed=8317498;
ondyloepiphyseal dysplasia.";
ience 244:978-980(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VARIANT WS-II ASP-198
  spondyloepiphyseal
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     480
                                                                                                                                                                                                                                                                                                                                                                                                          61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           854
                                                                                                                                                                                                                                                                                                                                                                                   374
                                                                                                                                                                                                                                                                                                                                                                                                                                   434
                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPPGAPGAPGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GEVGPPGPAGSAGARGAPGERGETGPPGTSGIAGPPGADGQPGAKGEQGEAGQKGDAGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                          1 GSEGPEGVRGEPGPPGPAGPAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=93140139; PubMed=8423604;
Cole W.G., Hall R.K., Rogers J.G.;
"The clinical features of spondyloepiphyseal dysplasia congenita
resulting from the substitution of glycine 997 by serine in the alpha
J. III] chain of type II collagen.";
J. Med. Genet. 30:27-35(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                 G.
                                                                                                                                                                                                                                                                                                                                      Gaps
                                                         a
gene
                                  Neumann
                                                                                                                              MEDLINE=93315508; PubMed=8325895;
Chan D., Taylor T.K.F., COLE W.G.,
"Characterization of an arginine 789 to cysteine substitution in
alpha I (II) collagen chains of a patient with spondyloepiphyseal
                                                                                                                                                                                                                                                                                                                                      ö
                                                         i,
                                                                                                                                                                                                                                                                                                            71.7%; Score 2202; DB 1; Length 1418; 71.9%; Pred. No. 1.3e-82; Live 40; Mismatches 113; Indels 0
VARIANT SEDC CYS-206.
WARDINE=94063862; PubMed=8244341;
Williams C.J., Considine E.L., Knowlton R.G., Reginato A., N. Harrison D., Buxton P., Jimenez S.A., Prockop D.J., "Spondyloepiphyeeal dysplasia and precocious osteoarthritis family with an Arg75-->Cys mutation in the procollagen type
                                                                                                                                                                              J. Biol. Chem. 268:15238-15245(1993)
[25]
                                                                                    (A1).";
Genet. 92:499-505(1993)
                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity 71.9°
Matches 391; Conservative
                                                                                                                                                                                                                   VARIANT SEDC SER-1128.
                                                                                                                     CYS-920.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKDG 858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     541 GKEG 544
                                                                                                                     SEDC
                                                                                                                                                                     alpha 1 (I
dysplasia.
                                                                                                                                                                                                                                                                                                                                                                                                                                      375
                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                675
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               795
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              855
                                                                                                                    VARIANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
  엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                쉱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                  ठ
                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
```

ö

Gaps

ö

9

180 535

```
356 GPEGAQGSRGEPGNPGSPGPAGASGNPGTDGIPGAKGSAGAPGIAGAPGFPGPRGPPGPQ 415
                                                                                                                                                                                                                                                                                                          61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                          181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDAGARGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                       1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                          121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rattus norvegicus (Rat).
Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Rodentia, Sciurognathi, Muridae, Murinae, Rattus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Comparative sequence studies of rat skin and tendon collagen. II. The absence of a short sequence at the amino terminus of the skin alpha-1 chain.";
                                                                                                          Length 1459;
                                                                                                       Query Match 71.4%; Score 2192; DB 1; Length 1 Best Local Similarity 71.7%; Pred. No. 3.4e-82; Matches 390; Conservative 40; Mismatches 114; Indels
                               /FTId=VSP 001140.
1459 AA; 139154 MW; F6C84FA7C532E7F2 CRC64;
          Missing (in isoform Short)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 7
CALL RAT

CALL RAT

D CALL RAT

AC PO2454; P02455;
DT 21-JUL-1986 (Rel. 01, Created)
DT 21-JUL-1986 (Rel. 01, Created)
DT 21-JUL-1994 (Rel. 28, Last sequence update)
DT 28-FEB-2003 (Rel. 41, Last sequence update)
DE Collagen alpha 1(1) Chain (Fragments).
COLLA1.

COLLA1.

OC Raturota, Metazoa; Chordata, Craniata, Vertebrate
OC Bukaryota, Metazoa; Chordata, Craniata, Vertebrate
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Murid
OX NCBL_TaxID=10116;
RN NCBL_TaxID=10116;
RN MEDLINE=69155173; PubMed=5777344;
RA BOTASTEAIN P.;
RT "Comparative sequence studies of rat skin and ten
RT "Comparative sequence studies of rat skin and ten
RT "Comparative Sequence Studies of Rat Sciurognative Alpha-1 chain.";
RI Biochemistry 8:63-71(1969).
RN SEQUENCE OF 5-19.
RN MEDLINE=67162268; PubMed=5337886;
       98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    896 GKDG 899
       30
       VARSPLIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301
                                                       SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
       STT
                                                                                                                                                                                                                                                       Пp
                                                                                                                                                                                                                                                                                                                                                    원
                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    cartilaginous tissues.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Name=Shorr;
IsoId=228481-2; Sequence=VSP 001139, VSP 001140;
-!- PTM: Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
-!- SIMILARITY: Contains 1 VWFC domain.
                                                                                                                                                                                               Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Rodentia, Sciurognathi, Muridae, Murinae, Mus.
NCBI_TaxID=10090,
                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A., AND ALTERNATIVE SPLICING.
MEDLINE=91358489; PubMed=1885613;
Metearanta M., Toman D., de Grombrugghe B., Vuorio E.;
Mouse type II collagen gene. Complete nucleotide sequence, exon structure, and alternative splicing.";
J. Biol. Chem. 266:16862-16869(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 1455-1459 FROM N.A.
MEDLINE=91274355; PubMed=2054384;
Metaaranta M., Toman D., de Crombrugghe B., Vuorio E.;
"Specific hybridization probes for mouse type I, II, III and IX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Probom, PD00007; Clg_helix; 5.

Probom, PD000078; Fib_collagen_C; 1.

SMART; SM00038; COLFT; 1.

PROSITE; PS01208; VWFC_1; 1.

PROSITE; PS50184; VWFC_2; 1.

Extracellular matrix; Connective tissue; Repeat; Hydroxylation; Glycoprotein; Collagen; Signal; Alternative splicing.

SIGNAL

25.

POTENTIAL.
                                       01-DEC-1992 (Rel. 24, Created)
01-DEC-1992 (Rel. 24, Last sequence update)
15-WAR-2004 (Rel. 43, Last annotation update)
Collagen alpha 1(II) chain precursor [Contains: Chondrocalcin]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TRIPLE-HELICAL REGION.
NONHELICAL REGION (C-TERMINAL).
Q -> R (in isoform Short).
/FIId=VSP_001139.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AMINO-TERMINAL PROPEPTIDE (BY SIMILARITY).
COLLAGEN ALPHA 1(II) CHAIN.
CHONDROCALCIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Event=Alternative splicing; Named isoforms=2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1459 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IsoId=P28481-1; Sequence=Displayed;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL, M65161, AAA68100.1, -.
EMBL, X57982, CAA41047.1; -.
MGD, MGI.88452, CAA21047.1; -.
InterPro; IPR008161, Clg helix.
InterPro; IPR008161, Collagen.
InterPro; IPR001007; WiP.
InterPro; IPR001007; WiP.
Efam; PF01410; COLFI; 1.
Pfam; PF01391; Collagen; 18.
Pfam; PF01391; Collagen; 18.
STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1213
1459
186
1186
1213
                                                                                                                                                                       Mus musculus (Mouse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Name=Long;
MOUSE
```

DOMAIN DOMAIN DOMAIN VARSPLIC

PROPEP CHAIN

480 835

Fri

us-10-658-989a-4.rsp

```
SEQUENCE
B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE-85122694; PubMed-6395893;

MEDLINE-85122694; PubMed-6395893;

Genoves C., Kream B.;

"Construction of DNA sequences complementary to rat alpha 1 and alpha
2 collagen mRNA and their use in studying the regulation of type I
collagen synthesis by 1,55-dihydroxyvitamin D.";

Biochemistry 23:6210-6216(1984).

-i-FUNCTION: Type I collagen is a member of group I collagen
(fibrillar forming collagen).
            ĕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 239-418.
MEDLINE-73005942; PubMed-4342027;
MEDLINE-73005942; PubMed-4342027;
MEDLINE-73005942; PubMed-1342027;
MELYDECTURE Of TAIL SKIN Collagen alpha 1-CBB. Amino acid sequence of the hydroxyl amine-produced fragment HA2.";
Biochemistry 11:3798-3806 (1972).
                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF 140-238.
MEDLINE-72136131; PubMed-4335087;
MEDLINE-72136131; PubMed-4335087;
MEDLINE-72136131; PubMed-4335087;
Structure of rat skin collagen alpha 1-CB8. Amino acid sequence of the hydroxylamine-produced fragment HA1.";
Biochemistry 10:4470-4478(1971).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUBUNIT: Trimers of one alpha 2(I) and two alpha 1(I) chains. TISSUE SPECIFICITY: Forms the fibrils of tendon, ligaments and bones. In bones the fibrils are mineralized with calcium
Kang A.H., Bornstein P., Piez K.A.; "The amino acid sequence of peptides from the cross-linking region
                                                                                                                                                                                  Butler W.T., Ponds S.L.; "Chemical studies of rat skin "Chemical studies on the cyanogen bromide peptides of rat skin collagen. Amino acid sequence of alpha 1-CB4."; Blochemistry 10:2076-2081(1971).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           rat skin
                                                                                                       "The incomplete hydroxylation of individual prolyl residues in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 568-651.

MEDLINE-74011954; PubMed-4126850;

Stoltz M., Timpl R., Furthmayr H., Kuehn K.;

"Structural and immunogenic properties of a major antigenic determinant in neutral salt-extracted rat-skin collagen.";

Eur. J. Biochem. 37:287-294(1973).
                                                                                                                                                                                                                                                                                           "Chemical studies on the cyanogen bromide peptides of rat scallagen. The covalent structure of alpha 1-CB5, the major hexose-containing cyanogen bromide peptide of alpha 1."; Biochemistry 9:14-50(1970).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE OF 419-567.

MEDLINE=74271984; PubMed=4366532;

Butler W.T., Underwood S.P., Finch J.E. Jr.,;

"Chemical studies on the cyanogen bromide peptides of collagen. Amino acid sequence of alpha 1-CB3.";

Biochemistry 13:2946-2953(1974).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 651-671.
MEDLINE=73049495; PubMed=4636751;
Stollar M., Timpl R., Kuehn K.;
"Non-helical regions in rat collagen alpha 1-chain.";
FEBS Lett. 26:61-65(1972).
                                                                                                                    collagen.";
J. Biol. Chem. 242:2572-2574(1967)
                                                                            MEDLINE=67165368; PubMed=4290711;
                                                                                                                                                         SEQUENCE OF 56-102.
MEDLINE=71263178; Pubmed=4327399;
                                                                                                                                                                                                                                                   SEQUENCE OF 103-139.
MEDLINE=70085124; PubMed=5411206;
                         rat skin collayen. ,
Biochemistry 6:788-795(1967),
                                                               SEQUENCE OF 20-55.
                                                                                          Bornstein P.;
                                                                                                                                                                                                                                                                                Butler W.T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             107
```

```
wiss-pror en.

den the Saiss Ins.

furopean Bioinformatic.

de by non-profit institut.

modified and this statement is nentities requires a license agreeme.

or send an email to license@isb.sb.ch).

CE EMBL; Mil422; AA440832.1; ALT SEQ.

DR InterPro; IPRO01007; Collage.

DR InterPro; IPRO01007; Clg helix.

DR PROSITE; PSO1208; VWFC 1; PARITAL.

KW Extracellular matrix; Connective tissue; Repeat; Hydroxylation; KW Glycoprotein; Collage; PRRITAL.

KW Extracellular matrix; Connective tissue; Repeat; Hydroxylation; KW MOD_RES

MOD_RES

TONORERS 1

MOD_RES

TONORERS 28 28 HYDROXYLATION (PROBABLE).

AGING PROBABLE).

AGING PROBABLES

AGING PROBABLE
                                                                                                                                                                                                                                                             This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation. The European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce) or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 380 GSPGSPGPDGKTGPPGPAGZBGRPGPAGPPGARGQAGWMGFPGPKGTAGEPGKAGERGVP 439
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   440 GPPGAVGPAGKDGEAGAQGAPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGZZ 499
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61 GPGGPPGPKGDSGBPGAPGSKGDTGAKGBPGPVGVBGPPGPBGFBGKPGARGBPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         320 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ---GPPGPPGSPGZZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      260 GPSGAPGPKGNSGEPGAPGNKGDTGAKGEPGPAGVQGPPGPAGEEGKRGARGEPGPSGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121 GPPGERGGPGSRGFPGADGVAGPXGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPGSPGPDGKTGPPGPAGEDGRPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                             t
0
                                                                                                                                                         PTM: O-linked glycan consists of a Glc-Gal disaccharide bound to the oxygen atom of a post-translationally added hydroxyl group.
hydroxyapatite. PTM: Proline residues at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MAJOR ANTIGENIC DETERMINANT (OF N
SALT-EXTRACTED RAT SKIN COLLAGEN)
9DC3114204AC4918 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              70.1%; Score 2151; DB 1; Length 671; 77.5%; Pred. No. 9.1e-81; ive 27; Mismatches 36; Indels 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    60615 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity 77.55
Matches 382; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAPGLQGMSGLZ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        671 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         260
```

```
544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGPAGKEG 467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGPAGKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MOD RES
CARBOHYD
MOD RES
NON CONS
MOD RES
MOD RES
MOD RES
MOD RES
MOD RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MOD_RES
MOD_RES
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       355 (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  415
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
   SOUND THE FEET SET SOUND SOUND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \delta
GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                              -----GPPGSAGSPGKBGLBGLPGP1GPPGPRGRTGBAGPS 631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        [1] SEQUENCE OF 1-19. White the second of th
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    [3] SEQUENCE OF 146-294.

SEQUENCE OF 146-294.

MEDLINE=73049499; PubMed=4673951;

Fietzek P.P., Wendt P., Kell I., Kuehn K.;

"The covalent structure of collagen: amino acid sequence of alpha-1-
CB3 from calf skin collagen.";

FEBS Lett. 26:74-76(1972).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            sequence of peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 20-145.

MEDLINE-76023230, PubMed=1164916;

Fietzek P.P., Kuchn K.;

"The covalent structure of collagen: amino-acid sequence of the "The covalent structure alpha-1-CB2, alpha-1-CB4 and alpha-1-CB5 from calf-skin collagen.";

Eur. J. Biochem. 52:77-62(1975).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       alpha-1-CB6-C2.",

Bur. J. Blochem. 30:163-168(1972).

-!- FUNCTION: Type I collagen

-!- FUNCTION: Type I collagen).

-!- SUBJMIT: Trimers of one alpha 2(I) and two alpha 1(I) chains.

-!- TISSUE SPECIFICITY: Forms the fibrils of tendon, ligaments and bones. In bones the fibrils are mineralized with calcium hydroxyapatite.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Buteleostomi; Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea; Bovidae; Bovinae; Bos. (NCBI_TaxID=9913;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 성
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=74086118; PubMed=4359390;
Fietzek P.P., Rexrodt F.W., Hopper K.E., Kuehn K.;
"The covalent Feructure of collagen. 2. The amino-acid sequence
alpha-1-CB7 from calf-skin collagen.";
Eur. J. Biochem. 38:396-400(1973).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 563-675.
MEDIINE=73042276, PubMed=4343808;
Wendt P., Mark K.V.D., Rexrodt F., Kuehn K.;
"The covalent structure of collagen. The amino-acid sequence of
"The covalent structure of collagen. The amino-acid sequence of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kuehn K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=73042275; PubMed=4343807;
Fietzek P.P., Rexrodt F.W., Wendt P., Stark M.,
"The covalent structure of collagen. Amino-acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      21-JUL-1986 (Rel. 01, Created)
01-FEB-1994 (Rel. 28, Last sequence update)
15-WAR-2004 (Rel. 43, Last annotation update)
Collagen alpha 1(1) chain (Fragments).
                                                                                                                                                                                                                                                                                                                                                                                                        779 AA
                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             calf and human collagen.";
Eur. J. Biochem. 27:231-237(1972)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           3ur. J. Biochem. 30:169-183(1972)
                                                                 584 GPSGASGPAGPR-----
                                                                                                                                              493
                                                                                                                                                                                                    GPPGPPGPPGPPG 644
                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                              GPAGPAGPPGPIG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 676-751.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           taurus (Bovine)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                skin collagen.
                                                                                                                                                                                                                                                                                                                                                                                             CA11 BOVIN
P02453;
                                                                                                                                              481
                                                                                                                                                                                                               632
421
                                                                                                                                                                                                                                                                                                                       RESULT 8

CA11_BOVIN

CA11_BOVIN

CA11_BOVIN

CA11_BOVIN

CA11_BOVIN

CA11_BOVIN

CA11_BOVIN

CA11_BOVIN

CA11_GAB

                                                                 셤
8
                                                                                                                                      δ
```

```
.
9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          55 GPSGPEGPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEP 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    354
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  281 GAPGSQGAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGAPGKDGVRGLTGPIGPPGPA 340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           474
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  55
-i- PTM: Proline residues at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains. Pro-726 is the only 3-hydroxypro and the only hydroxylated proline in position X.
-i- PTM: O-linked glycan consists of a Glc-Gal disaccharide bound to the oxygen atom of a post-translationally added hydroxyl group.
-i- MISCELLANEOUS: The complete chain contains 1052 residues.
PIR; A91193; CGBOIS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               221 GKPGEQGVPGDLGAPGPSGARGERGFPGERGVEGPPGPAGPRGAPGNDGAKGDAGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        115 GPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               101 GMKGHRGFSGLDGAKGDAGPAGPKGEPGSPGENGAPGQMGPRGLPGFPGPKGAAGEPGKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        235 GERGVPGPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    295 GKPGEEGVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAFGDDGAKGDAGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAPGSEGAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               17 GPMGPSGPRGLPGP----PGA-----PGPQGFQGPPG---GEPGEPGASGPM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       175 GAKGLIGSPGSPGPDGKTGPPGPAGEDGRPGPPGARGEAGVMGFPGPKGAAGEPGKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     161 GERGVPGPPGANGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGRQGLPGPAGPPGEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAPGDKGEAGPSGPA---GTRGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          475 GDAGPPGPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GDAGPPGPAGPAGPAGPPGPIGNVGAPGPKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       39; Gaps
                                                                                                                                                                                                                                                                                                                                                                         tissue; Repeat; Hydroxylation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           67.6%; Score 2076.5; DB 1; Length 779; 78.0%; Pred. No. 9.9e-78; Indels 18; Mismatches 51; Indels 39;
                                                                                                                                                                                                                                                                                                                                                                                           Glycoprotein, Collagen, Pyrrolidone carboxylic acid.
MOD_RES 1 1 1 PYRROLIDONE CARBOXYLIC ACID.
MOD_RES 9 9 INVOLVED IN CROSS-LINKING.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          O-LINKED (GAL. . .).
HYDROXYLATION (POTENTIAL)
HYDROXYLATION (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HYDROXYLATION.
E554A7FF084283D1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HYDROXYLATION (
HYDROXYLATION (
HYDROXYLATION (
HYDROXYLATION (
HYDROXYLATION (
HYDROXYLATION (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LATION.
                                                                                                                                                                                                                                                                                        InterPro, IPR001007, VWF C.
robom, PD0000007, Clg hellx; 1.
PROSITE; PS01208; VWFC 1; PARTAL.
Extracellular matrix; Connective t
                                                                                                                                                                                                                             InterPro; IPR008161; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR001007; VWF C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           70346 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches 382; Conservative
```

```
DORAN 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    쇰
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce) or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                  IISSUE=Aorta;
MEDLINES=98290219; PubMed=9628255;
Shirai T., Hattori S., Sakaguchi M., Inouye S., Kimura A., Ebihara T.,
Irie S., Nagai Y., Hori H.;
"The complete cDNA coding sequence for the bovine proalpha2(I) chain
of type I procollagen.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TISSUB=Skin,
MEDLINE=75008198; PubMed=4412529;
Fietzek P.P., Furthmayr H., Kuehn K.;
Comparative sequence studies on alpha2-CB2 from calf, human, rabbit and pig-skin collagen.";
Eur. J. Biochem. 47:257-261(1974).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIM: Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
                                                                                                                                                                                                             Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Fietzek P.P., Rexrodt F.W.; "The covalent structure of collagen. The amino-acid sequence of alpha2-CB4 from calf-skin collagen.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=75036115; PubMed=4609475;
Fietzek P.P., Breitkreutz D., Kuehn K.;
"Amino acid sequence of the amino-terminal region of calf skin
                                 CA21_BOVIN
P02465, O65649,
21-JUL-1986 (Rel. 01, Created)
APAY-2000 (Rel. 39, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Biochim. Biophys. Acta 365:305-310(1974).
                                                                                                                                                Collagen alpha 2(I) chain precursor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=75059250; PubMed=4435743;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 95-415, AND REVISION.
TISSUE=Skin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Eur. J. Biochem. 59:113-118(1975)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=76091874; PubMed=173531;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   of type I procollagen.";
Matrix Biol. 17:85-88(1998).
                                                                                                                                                                                             Bos taurus (Bovine).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF 416-445.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 446-481.
                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 80-98.
                                                                                                                                                                                                                                                                                  NCBI_TaxID=9913;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              rissuE=Skin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  collagen
```

```
272 GPAGPAGPAGEVGLPGLSGPVGPPGNPGANGLPGAKGAAGLPGVAGAPGLPGPRGIPGPV 331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGFKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301 GVPGDLGAPGPSGARGEPGFFGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAFGE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             752 GPTGPVGAAGPSGPNGPPGPAGSRGDGGPPGATGPPGAAGRTGPPGPSGISGPPGPPGPA 811
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      332 GAAGATGARGLVGEPGPAGSKGESGNKGEPGAVGQPGPPGPSGEEGKRGSTGELGPAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPPGPEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            512 GLAGARGAPGPDGNNGAQGPPGLQGVQGGKGEQGPAGPPGFPGCPGCPAGTAGEAGKPGER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  632 GPSGPSGLPGERGAAGIPGGKGEKGETGLRGDIGSPGRDGARGAPGAIGAPGPAGANGDR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       692 GEAGPAGPAGPAGPRGSPGERGEVGPAGPNGFAGPAGAAGQPGAKGERGTKGPKGENGPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGBRGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGARDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                     CONVERTED TO AN ALDEHYDE GROUP THAT IS UNVOLVED IN CROSS-LINKING (PROBABLE).
HYDROXYLATION (PROBABLE).
HYDROXYLATION (PROBABLE).
HYDROXYLATION (PROBABLE).
HYDROXYLATION (PROBABLE).
HYDROXYLATION (PROBABLE).
                                                                                                                                                                                                                                                                                                                                                          GROUP THAT IS
EMBL; AB008683; BAA25171.1; -.
InterPro; IPR008161; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR008160; Collagen.
InterPro; IPR008160; Collagen.
Pfam; PF01341; Collagen; 16.
ProDom; PP000007; Clg helix; 3.
ProDom; PP000079; Fib_collagen_C; 1.
SMART; SM00083; COLFI; 1.
Extracellular matrix; Connective tissue; Repeat; Hydroxylation; Collagen; Signal; Pyrrolidone carboxylic acid.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   63.5%; Score 1949; DB 1; Length 1364; llarity 65.3%; Pred. No. 1.9e-72; Conservative 44; Mismatches 145; Indels 0
                                                                                                                                                                                                                                                               AMINO-TERMINAL PROPEPTIDE.
COLLAGEN ALPHA 2 (1) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE.
PYROLIDONE CARBOXYLIC ACID.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            77 V -> P (IN REF. 3).

17 T -> K (IN REF. 3).

18 T -> K (IN REF. 3).

19 PGA -> AAP (IN REF. 3).

24 AT -> TA (IN REF. 4).

129064 MW; 5593F4D6B9ED119A CRC64;
                                                                                                                                                                                                                                                                    79
1100
1364
80
84
                                                                                                                                                                                                                                                                                                                                                                                                   175
196
262
307
352
157
187
211
300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      423 42
1364 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Simi
les 355;
                                                                                                                                                                                                                                                                                                                                                                                                 MOD_RES
MOD_RES
MOD_RES
MOD_RES
CONFLICT
CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                      CHAIN
PROPEP
MOD_RES
MOD_RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                            SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    원
```

ö

480

751

691

631

540

```
PROPEP
                                                                                                                                                                                                                                                               DOMAIN
                                                                                                                                                                                                                                                                              DOMAIN
                                                                                                                                                                                                                       DOMAIN
                                                                                                                                                                                                                                      DOMAIN
                                                                                                                                                                            CHAIN
8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \dot{\delta}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \stackrel{>}{\circ}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBD outstation the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isp-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Nucleic Acids Res. 11:2733-2744(1983).

Nucleic Acids Res. 11:2733-2744(1983).

-!- FUNCTION: Collagen type III occurs in most soft connective tissues along with type I collagen.

-!- SUBBNIT: Trimers of identical alpha 1(III) chains. The chains are linked to each other by interchain disulfide bonds. Trimers are also cross-linked via hydroxylysines.

-!- FUNT Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
                                                                                                                                                  Gallus gallus (Chicken).
Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi;
Archosauria, Aves; Neognathae, Galliformes, Phasianidae, Phasianinae,
                                                                                                                                                                                                                                                                                                                                                           MEDITNE-84270666; PubMede-6547770;
Yamada Y., Liau G., Mudryj M., Obici S., de Crombrugghe B.;
"Conservation of the sizes for one but not another class of exons in two chick collagen genes.";
Nature 310:333-337(1984).
                                                                                                                                                                                                                                                                         Nah H.-D., Niu Z., Adams S.L.,
"An alternative transcript of the chick type III collagen gene that
does not encode type III collagen.";
J. Biol. Chem. 269:16443-16448 (1994).
                                                                                                                                                                                                                                                                                                                                   [2]
SEQUENCE OF 29-96; 332-397; 431-484; 503-535 AND 869-976 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=83220816; PubMed=6856474;
Yamada Y, Kuhn K., de Crombrugghe B.;
A conserved nucleotide sequence, coding for a segment of the C-propeptide, is found at the same location in different collagen
                                                     CA13 CHICK STANDARD; PRT; 1262 AA. P11105; P79758; P9759; Q90794; Q92029; O1-OCT-1989 (Rel. 12, Created) F6-OCT-2001 (Rel. 40, Last sequence update) R8-F8-2003 (Rel. 41, Last annotation update) Collagen alpha 1(III) chain precursor (Fragments)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL, U07973, AAA83407.1, -.
EMBL, X00822; CAB52686.1, -.
EMBL, X00823; CAB52686.1, OINED.
EMBL, X00826; CAA25397.1, ALT SEQ.
EMBL, X00825; CAA25397.1, JOINED.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; X00830; CAA25401.1; --
EMBL; X00831; CAA25402.1; --
EMBL; K02302; AAD15299.1; --
EMBL; K02301; AAD15298.1; --
EMBL; M36662; AAA18519.1; ALT_SEQ.
                                                                                                                                                                                                                                                                MEDLINE=94266842; PubMed=8206952;
                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE OF 977-1262 FROM N.A
                                                                                                                                                                                                                                      SEQUENCE OF 1-886 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; X00827; CAA25398.1;
EMBL; X00828; CAA25399.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PIR; A05269; A05269.
PIR; I50694; I50694
                                                                                                                                                                                                        NCBI_TaxID=9031;
                                                                                                                                       COL3A1.
                            RESULT 10
CA13_CHICK
```

InterPro; IPR008161; Clg helix. InterPro; IPR008160; Collagen. InterPro; IPR000885; Fib\_collagen\_C.

InterPro; InterPro;

```
ij
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          718
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GLPGLOGMPGERGASGSPGPKGDKGEPGGKGADGLPGARGERGNVGPIGPPGPAGPPGDK 778
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGD-----A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             359 GASGNPGERGEPGPOGOAGPPGPGPPGRAGSPGGKGEMGPSGIPGGPGPPGGRGLPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           419 GTSGNPGAKGTPGEPGKNGAKGDPGPKGERGENGTPGARGPPGEEGKRGANGEPGQNGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9; Gaps
                                                                                                                                                                                                                                                                                                                   SIMILARITY).
TRIPLE-HELICAL REGION (BY SIMILARITY).
NONHELICAL REGION (C-TERMINAL) (BY
InterPro; Interposition Figuration InterPro; IRR001007; VWF C.
ProDom; PD000007; Claffix; 1.
ProDom; PD002078; Fib_collagen_C; 1.
SWART; SW00214; VWFC; 1.
PROSITE; PS01208; VWFC 1; 1.
PROSITE; PS01208; VWFC 1; 1.
Extracellular matrix; Connective tissue; Repeat; Hydroxylation; Glycoprotein; Collagen; Signal.
SIGNAL 1 AMINO-TERMINAL PROPERTINE IN PROPER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      63.0%; Score 1934.5; DB 1; Length 1262; 63.8%; Pred. No. 7e-72; ive 31; Mismatches 160; Indels 9;
                                                                                                                                                                                                                                                                                           (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . .) (POTENTIAL)
                                                                                                                                                                                                                                          (BY
                                                                                                                                                                                                                                                                                             NONHELICAL REGION (N-TERMINAL)
                                                                                                                                                                                                                                                                                                                                                                                                              INTERCHAIN (BY SIMILARITY).
INTERCHAIN (BY SIMILARITY).
HYDROXYLATION (BY SIMILARITY).
HYDROXYLATION (BY SIMILARITY).
HYDROXYLATION (BY SIMILARITY).
                                                                                                                                                                                                                     COLLAGEN ALPHA 1(III) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1262 AA; 121249 MW; 96ABE7B2E9DEB43D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HYDROXYLATION (BY S)
N-LINKED (GLCNAC.
E -> K (IN REF. 2).
F -> S (IN REF. 3).
                                                                                                                                                                                                                                                            SIMILARITY)
                                                                                                                                                                                                                                                                                                             SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                               SIMILARITY)
                                                                                                                                                                                                           SIMILARITY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches 353; Conservative
                                                                                                                                                                                                                         1003
1262
                                                                                                                                                                                                                                                                                                                                994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1163
96
1132
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                         145
                                                                                                                                                                                                                                                                            29
145
                                                                                                                                                                                                                                                                                                                                                                                                                                                   262
283
859
1163
96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 719
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                   MOD_RES
MOD_RES
MOD_RES
CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481
                                                                                                                                                                                                                                                                                                                                                                                                     NON CONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                   NON CONS
                                                                                                                                                                                                                                                                                                                                                                                                                                    DISULFID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \dot{\delta}
```

```
Fietzek P.P., Kuehn K.;
"The covalent structure of collagen: amino acid sequence of the N-terminal region of alpha2-CB3 from rat skin collagen and alpha2-CB3.5 Hoppe-Seyler's Z. Physiol. Chem. 355:647-650(1974).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TISSUE=Skin;
MEDLINE=67162268; PubMed=5337886;
Kang A.H., Bornstein P., Piez K.A.;
"The amino acid sequence of peptides from the cross-linking region of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Fietzek P.P., Piez K.A.; "Interpretable of the cyanogen bromide peptides from "Isolation and characterization of the cyanogen bromide peptides from the alpha 2 chain of rat skin collagen."; Biochemistry 8:2129-2133(1969).
                                                                                                                                                                                                                                                                                                                                                                                                                      Rattus norvegicus (Rat).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Highberger J.H., Kang A.H., Gross J.;
Comparative studies on the amino acid sequence of the alpha 2-CB2
peptides from chick and rat skin collagens.";
Biochemistry 10:610-616(1971).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TISSUE=Skin;

MEDLINE-T4055004; PubMed=4763308;

Fietzek P.P., Kuehn K.;

"The covalent structure of collagen: amino acid sequence of the N-terminal region of alpha 2-CB5 from rat skin collagen.";

FEBS Lett. 36:289-291(1973).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 102-144.

MEDIANE=73049496, PubMed=4636752,
Fietzek P.P., Kell I., Kuehn K.;
Fietzek P.P., Kell I., Kuehn K.;
Fietzek P.P., Sell I., Kuehn K.;
Fietzek P.P., Kell I., Kell I., Kuehn K.;
Fietzek P.P., Kell I., Ke
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
Guenther D., Seibold S., Marx M.;
Submitted (JAN-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                    P02466; Q9R1E8;
21-JUL-1986 (Rel. 01, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
Collagen alpha 2(I) chain precursor.
                                                                                                                                                                                                                 PRT; 1372 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=75059250; Pubmed=4435743;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=69206881; PubMed=5785232;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=71115216; PubMed=5544653;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               rat skin collagen.";
Biochemistry 6:788-795(1967)
                                            GPPGHPGPAGNNG 911
   GPPGPPGPAGKEG 544
                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF 791-836.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEOUENCE OF 423-452.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 453-501.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 99-102.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 86-98.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=10116;
532
                                                                                                                                                                                                              CA21 RAT
   8
                                                         셤
```

```
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   340 GAAGATGPRGLVGEPGPAGSKGETGNKGEPGSAGAQGPPGPSGEEGKRGSPGEPGSAGPA 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            280 GPAGPAGPRGEAGLÞÓLSGPVGÞPGNÞGANGLTGAKGATGLÞGVAGAÞÓLÞGPRGIÞGPV 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (BY SIMILARITY).

COLLAGEN ALPHA 2 (1) CHAIN.
CARBOXTL-TERMINAL PROPEPTIDE

(BY SIMILARITY).
CELL ATTACHNENT SITE (POTENTIAL).
CONVERTED TO AN ALDEHYDE GROUP THAT IS
INVOLYED IN CROSS-LINKING.
N-LINKED (GLCNAC. .) (POTENTIAL).
T -> P (IN REF. 4).
S -> P (IN REF. 4).
S -> P (IN REF. 5).
E -> Z (IN REF. 6).
MISSING (IN REF. 7).
             MEDLINE=10181852; PubMed=5443712;

Vuust J., Lane J.M., Fletzek P.P., Miller E.J., Piez K.A.;

Vuust J., Lane J.M., Fletzek P.P., Miller E.J., Piez K.A.;

"The order of the CNBr peptides from the alpha 2 chain of collagen.";

Blochem. Biophys. Res. Commun. 38:703-708(1970).

-i. FUNCTION: Type I collagen is a member of group I collagen

(fibrillar forming collagen).

-i. SUBUNIT: Trimers of one alpha 2(I) and two alpha 1(I) chains.

-i. TISSUE SPECIFICITY: Forms the fibrils of tendon, ligaments and bones. In bones the fibrils are mineralized with calcium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 GSEGPEGVRGEPGPPGPAGPAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                             -!- PTM: Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Extracellular matrix; Connective tissue; Repeat; Hydroxylation; Glycoprotein; Collagen; Signal; Pyrrolidone carboxylic acid. SIGNAL 1 24 POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 63.0%; Score 1934; DB 1; Length 1372; 64.7%; Pred. No. 7.8e-72; ive 44; Mismatches 148; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AMINO-TERMINAL PROPEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                          EMBL, AF121217, AAD41775.1; ...
InterPro; IPR008161; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR00885; Fib_collagen_C.
Pfam; PF01410; COLFI; 1.
Pfam; PF01391; Collagen; 18.
ProDom; PD000077; Clg_helix; 4.
ProDom; PD000077; Clg_helix; 4.
ProDom; PD0002078; Fib_collagen_C; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                129564 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     422
432
494
790
825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              502 79
825 82
1372 AA;
                                                                                                                                                                               hydroxyapatite
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
es 352; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     86
1109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SITE
SITE
MOD RES
MOD RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PROPEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROPEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SITE
 d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
```

```
DISEASE
    819
                                                                                                                                                                                                                                                                                                                                                                540
                                                                                                                                    GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                         361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                   669
                                                                                                                                                                                                                                                                                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                              GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
GPTGPVGAAGPSGPNGPPGPAGSRGDGGPPGMTGFPGAAGRTGPPGPSGITGPPGPPGAA
                                                                                                                                                                                                                                   GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Genetic distance of two fibrillar collagen loci, COL3A1 and COL5A2, located on the long arm of human chromosome 2."; Genomics 3:275-277(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 1227-1496 FROM N.A.
MEDLINE-85289337; PubMed=2411731;
Myers J.C., Loidl H.R., Seyer J.M., Dion A.S.;
"Complete primary structure of the human alpha 2 type V procollagen COOH-terminal propepties";
J. Biol. Chem. 260:11216-11222(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     [2]
MEDLINE=87146331; PubMed=3029669;
MEDLINE=87146331; PubMed=3029669;
Meil D., Bernard M.P., Gargano S., Ramirez F.;
"The pro alpha 2(V) collagen gene is evolutionarily related to the major fibrillar-forming collagens.";
Nucleic Acids Res. 15:181-198(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=89123368; PubMed=2914927; Moodbury D., Benson-Chanda V., Ramirez F.; Madino-terminal propeptide of human pro-alpha 2(V) collagen confor to the structural criteria of a fibrillar procollagen molecule."; J. Biol. Chem. 264:2735-2738(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Eukaryofa, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Primates, Catarrhini, Hominidae, Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 1449-1496 FROM N.A.
MEDLINE-89138450; PubMed-3224983;
Tsipouras P., Schwartz R.C., Liddell A.C., Salkeld C.S., Weil D.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-APR-1988 (Rel. 07, Created)
01-APN-1990 (Rel. 13, Last sequence update)
10-OCT-2003 (Rel. 42, Last annotation update)
collagen alpha 2(V) chain precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 1-463 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            [5]
SEOUENCE OF 208-227.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                                                                                                                                                          GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKEG 823
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TISSUE=Placenta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CA25 HUMAN
P05997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ramirez F.
                                                                                              520
                                                                                                                                    301
                                                                                                                                                                                                                                                   640
                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                            000
                                                                                                                                                                                                                                                                                                                                                                481
                                                                                                                                                                                                                                                                                                                                                                                                      260
                                                                                                                                                                                                                                                                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               820
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RESULT 12
CA25 HUMAN
IO 25 HUMAN
AC P05997,
DT 01-JAPR.
DT 01-JAPR.
DT 01-JAPR.
DT 01-JAPR.
DT 01-JAPR.
DT 01-JAPR.
COL5A2
OC COL5A2
OC BUKATY.
OC MAMMATY.
OC MAMMATY.
OC BUKATY.
OC BUKAT
                                                                                                                                                                   d
                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                6 B
                                                                                                                                                                                                                                                                                                                                                                                                요. 상
                                                        ò
                                                                                      d
                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
```

```
MRDLINS=2213002; pubMed=1571105;

MRDLINS=2213002; pubMed=1571105;

MRDLINS=2213002; pubMed=1571105;

RE GOOGNEGIATION of the alpha 3-chain of bunnan type V collagen and characterization by partial sequencing."

RE GOOGNEGE OR 288-29 AND 606-617.

RE GOOGNEGE OR 288-29 AND 606-617.
```

```
572
                                                                                                                                                                                                                                                                                                                                                                                                                       GSPGSPGPDGKTGPPGPAGEDGRPGPPGPRGEAGWMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGLQGMPGERGIACTPGPKGDRGGIGEKGAEGTAGNDGAGGLPGPLGPPGPPGPAGLLGEK 812
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGPPGAAGRVGPPGPSGDAGPPGPA 540
                                                                                                                                                                                                                                                                                                                               396 GPEGPQGQRGETGPPGPVGSPGLPGAIGTDGTPGPKGPTGSPGTSGP---PGSAGPPGSP
                                                                                                                                                                                                                                                                                                                                                                  GPOGSTGPOGNSGLPGDPGFKGEAGPKGEPGPHGIQGPIGPPGEEGKRGPRGDPGTLGPP 512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dvPdQRGAPGKDGKVGPYGPPGPPGLRGERGEQGPPGPTGFQGHPGPPGPPGEGGKPGDQ 692
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVPGGPGAVGPLGPRGERGNPGERGEPGITGLPGERGMAGGHGPDGPKGSPGPSGTPGDT 752
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    873 GPQGLAGSPGPHGPNGVPGLKGGRGTQGPPGATGFPGSAGRVGPPGPAGAPGPAGPLGEP 932
                                                                                                                                                                                                                                                                                                             GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE 60
                                                                                                                                                                                                                                                                                                                                                                                             GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                        62.6%; Score 1921.5; DB 1; Length 1496; 64.0%; Pred. No. 2.6e-71; ive 40; Mismatches 153; Indels 3;
                                                            PROSITE; PS01208; WWFC_1; 1.
PROSITE; PS50184; WWFC_2; 1.
Extracellular matrix; Connective tissue; Repeat; Hydroxylation; Glycoprotein; Collagen; Signal; Ehlers-Danlos syndrome; Disease mutation; 3D-structure.
                                                                                                                 COLLAGEN ALPHA 2(V) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE.
VWFC.
                                                                                                                                                                                                                                                        82827C17A8644F5A CRC64;
                                                                                                                                                                               HYDROXYLATION:
G -> R (in EDS-II).
FTIG=VAR 01358.
A -> P (IN REF. 6).
K -> T (IN REF. 3).
F -> S (IN REF. 3).
V -> A (IN REF. 4).
                                                                                                                                                      HYDROXYLATION.
HYDROXYLATION.
HYDROXYLATION.
                                                                                                                                                                                DRC...
G -> R (1...
/FIId=VAR_ /
A -> P (I)
K -> I /
F -> S
E -> S
      Pfam; PF01391; Collagen; 18.
Pfam; PF00093; vwc; 1.
Probom; PD000007; Clg helix; 5.
Probom; PD002078; Fib_collagen_C; 1.
SMART; SM00038; COLFI; 1.
                                                                                                                                                                                                                                                         144720
                                                                                                                                                                                                                                                                                          Matches 348; Conservative
                                                                                                                                                                                                                    1418
1438
1460
1496
                                                                                                                           1496
97
                                                                                                                                                                                                                                                         AA;
                                                                                                                                                                                                                                                                                  Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ĠKĖĠ 936
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKEG 544
                                                                                                                                                                                                                    1418
1438
1460
1496
                                                                                                                                                                                                          CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    753
                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                  453
                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                      513
                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                          573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        813
                                                                                                                                                                                                                                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         481
                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                           MOD RES
MOD RES
MOD RES
MOD RES
                                                                                                                                                                                         VARĪANT
                                                                                                                          PROPEP
                                                                                                                                    DOMAIN
                                                                                                                    CHAIN
셤
                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                        유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                               ઠ
                                                                                                                                                                                                                                                                                                                                                                                   ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
```

```
SEQUENCE FROM N.A.

SEQUENCE FROM N.A.

SEQUENCE FROM N.A.

SEQUENCE TROM N.A.

SEQUENCE TROM N.A.

SETAIN-C57BL/6J; TISSUE=Mammary gland;

A Strausberg R.L., Feingold E.A., Grouse L.H., Derge J.G.,

A Strausberg R.L., Seberg B., Buetow K.H., Schefer C.F., Bhat N.K.,

A Staperon M.; Soarse M.B., Bonaldo M.F., Carainer T.L., Schefer T. Haieh F.,

A Diatchenko L., Marusina K., Farmer A.A., Rubin G.M., Hong L.,

A Stapleton M.; Soarse M.B., Bonaldo M.F., Carainer T.L., Scheetz T.E.,

Brownstein M.J., Usdin T.B., Peters G.J., Abramson R.D., Mullahy S.J.,

Raha S.S., Loquellano N.A., Peters G.J., Abramson R.D., Mullahy S.J.,

Brownstein M.J., Worley K.C., Hale S., Garcia A.M., Gay L.J., Hulyk S.W.,

A Richards S., Worley K.C., Hale S., Garcia A.M., Gay L.J., Hulyk S.W.,

A Nilalon D.K., Muzny D.M., Sodergren E.J., Lu X., Gibbs R.A.,

Radan A., Young A.C., Shevohenko Y., Bouffard G.G.,

Blakesley R.W., Touchman J.W., Green E.D., Dickson M.C.,

RA Schiguez A.C., Gilimwood J., Schmutz J., Myers R.M.,

RA Schiguez A.C., Gilimwood J., Schmutz J., Myers R.M.,

Butterfield Y.S.N., Krzywinski M.I., Skalska U., Smailus D.E.,

Beneration and initial analysis of more than 15,000 full-length

"The Security Processing of the state of the 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Phillips C.L., Morgan A.L., Lever L.W., Wenstrup R.J., program A.L., Lever L.W., Wenstrup R.J., program a full-length cDNA for the murine pro alpha 2(1) collagen chain: comparison of the derived primary structure with human pro alpha 2(1) collagen."; Genomics 13:1345-1346(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Phillips C.L., Lever L.W., Pinnell S.R., Quarles L.D., Wenstrup R.J., Lever L.W., Pinnell S.R., Quarles L.D., Wenstrup R.J., "Construction of a full-length murine pro alpha 2(I) collagen cDNA lthe polymerase chain reaction."

J. Invest. Dermatol. 97:980-984(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PTM: Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylated in some or all of the chains.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Rodentia, Sciurognathi, Muridae, Murinae, Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           human and mouse cDNA sequences.";
Proc. Natl. Acad. Sci. U.S.A. 99:16899-16903(2002).
                                                                                                                                                                                                                                Last sequence update)
Last annotation update)
                                                                                            Ā
                                                                                            1372
                                                                                                                                                                      01-APR-1993 (Rel. 25, Created)
16-OCT-2001 (Rel. 40, Last sequence
15-WAR-2004 (Rel. 43, Last annotatio
COLlagen alpha 2(I) chain precursor.
COLIA2 OR COLA2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TISSUE=Calvaria,
MEDLINE=92372043; PubMed=1505972;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=92084969; Pubmed=1748823;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE OF 1-110 FROM N.A.
TISSUE=Calvaria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 1-23 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                           Mus musculus (Mouse)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=10090;
                                                                                            MOUSE
RESULT 13
CA21_MOUSE
```

ţ: \_;

540

```
[6]*
SEQUENCE OF 948-1049.
SEQUENCE OF 948-1049.
MEDLINE-80026031; PubMed=488911;
Allmann H., Fietzek P.P., Glanville R.W., Kuhn K.;
Allmann H., Fietzek P.P., Glanville R.W., Kuhn K.;
"The covalent structure of calf skin type III collagen. VI. The amino acid sequence of the carboxyterminal cyanogen bromide peptide alpha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE-80026027; PubMed=488907; Dewes H., Fietzek P.P., Kuhn K.; Teersek P.P., Kuhn K.; The amino "The covalant structure of calf skin type III collagen. II. The amino acid sequence of the cyanogen bromide peptide alpha 1(III)CB1,8,10,2 (positions 223-402).";
                                                                             760 GPTGSVGAAGPSGPNGPPGPVGSRGDGGPPGMTGFPGAAGRTGPPGPSGIAGPPGPPGAA
                                                  GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "The covalent structure of calf skin type III collagen. I. The amino acid sequence of the amino terminal region of the alpha 1(III) chain (positions 1-222).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE OF 423-571.

MEDLINE-80026028; PubMed=488908;

Bentz H., Fietzek P.P., Kuhn K.;

"The covalent structure of calf skin type III collagen. III. The amino acid sequence of the cyanogen bromide peptide alpha 1(III)CB4 (positions 403-551).";
                                                                                                                                                                                                                                                                                                                                                     Eukaryota; Mecazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos.
                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-80026026, PubMed-488906;
Fietzek P.P., Allmann H., Rauterberg J., Henkel W., Wachter E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 809-947.
MEDLINE=80026036; PubMed=488910;
Dewse H., Fietzek P.P., Kuhn K.;
"The covalent structure of calf skin type III collagen. V. The acid sequence of the cyanogen bromide peptide alpha 1(III)CB9A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=80026029; PubMed=488909;
Lang H., Glanville R.W., Fietzek P.P., Kuhn K.;
"The covalent structure of calf skin type III collagen: IV. The acid sequence of the cyanogen bromide peptide alpha 1(III)CBS (positions 552-788).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hoppe-Seyler's Z. Physiol. Chem. 360:821-832(1979).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Hoppe-Seyler's Z. Physiol. Chem. 360:809-820(1979).
[2] SEQUENCE OF 243-422.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hoppe-Seyler's Z. Physiol. Chem. 360:841-850(1979)
[5]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (position 789-927).";
Hoppe-Seyler's Z. Physiol. Chem. 360:851-860(1979)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hoppe-Seyler's Z. Physiol. Chem. 360:833-840(1979)
                                                                                                                                                                                                                                                        20-MAR-1987 (Rel. 04, Created)
20-MAR-1987 (Rel. 04, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
COLIAGEN alpha 1(III) chain.
                                                                                                                                                                                                                             PRT; 1049 AA
                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 572-808.
                                                                                                                                                                                                                                                                                                                                           Bos taurus (Bovine)
                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE OF 1-242.
                                                                                                                 GKEG 544
                                                                                                                                               820 GKEG 823
                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=9913;
                                                                                                                                                                                                                           CA13 BOVIN
P04258;
                                                  481 (
                                                                                                                 541
                                                                                                                                                                                                            CA13_F
                                                  à
                                                                               엄
                                                                                                                 8
                                                                                                                                          8
                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-cib.ch)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           280 GPAGPAGPRGEVGLPGLSGPVGPPGNPGTNGLTGAKGATGLPGVAGAPGLPGPRGIPGPA 339
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPGGPPGPFKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              340 GAAGATGARGLVGEPGPAGSKGESGNKGEPGSVGAQGPPGPSGEEGKRGSPGEAGSAGPA 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   520 GLAGARGAPGPDGNNGAQGPPGPQGVQGGKGEQGPAGPPGFQGLPGPSGTTGEVGKPGER 579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GSEGPEGVRGEPGPPGPAGAAGPAGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CONVERTED TO AN ALDEHYDE GROUP THAT INVOLVED IN CROSS-LINKING (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                               SMLTACELLULAR MALTÍX; CONNECTIVE LISSUE; Repeat; Hydroxylation; Glagen; Signal; Pyrrolidone carboxylic acid. SIGNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              62.4%; Score 1915; DB 1; Length 1372; 64.2%; Pred. No. 4.5e-71; ive 45; Mismatches 150; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                     (BY SIMILARITY).
COLLAGEN ALPHA 2(I) CHAIN.
CARBOXYL-TERMINAL PROPEPTIDE
(BY SIMILARITY).
PYRROLIDONE CARBOXYLIC ACID (BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0D17DF5D6C1452D1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                        AMINO-TERMINAL PROPEPTIDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N-LINKED (GLCNAC. V -> A (IN REF. 4).
R -> IT (IN REF. 1).
                                                                                                                                                                                          MED: A43291, A43291.
MGD: MGI:88468, COlla2.
InterPro; IPR008161; Clg helix.
InterPro; IPR008860; Collagen.
InterPro; IPR00885; Fib_collagen_C.
                                                                                                                                                                                                                                                                           Pfam; PF01410; COLFI; 1.
Pfam; PF01391; Collagen; 18.
ProDom; PD00007; Clg_helix; 6.
SMART; SM00038; COLFI; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   129557 MW;
                                                                                                                                              EMBL; BC007158; AAH07158.1; -. EMBL; BC042503; AAH42503.2; -. EMBL; K01832; AAA37331.1; -.
                                                                                                                                EMBL; X58251; CAA41205.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity 64.23
Matches 349; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                      1108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1273
15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1167
                                                                                                                                                                                                                                                                                                                                                                                              8
8
2
8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1372 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                      86
1109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1273
15
1167
                                                                                                                                                                                                                                                                                                                                                                                                        23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CARBOHYD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CONFLICT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                      CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MOD_RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MOD_RES
                                                                                                                                                                                                                                                                                                                                                                                                          PROPEP
      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
```

The amino

amino

Fri

us-10-658-989a-4.rsp

```
744 GKDGPPGPPGSNG 756
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REVISIONS
                                                                  T 15
HUMAN
                                                               셤
1(III)CB9B (positions 928-1028).";
Hoppe-Seyler's Z. Physiol. Chem. 360.861-868(1979).
1-PUNCTION: Collagen type III occurs in most soft connective tissues along with type I collagen.
1 Innead to each other by interchain disulfide bonds. Trimers are also cross-linked to his hydroxylysines.
1 PTM: Prolines at the third position of the tripeptide repeating unit (G-X-Y) are hydroxylysines, and the chains.

PIR, A02865; CGB078.
InterPro; IPR008161; Clg helix.
InterPro; IPR008161; Clg helix.
InterPro; IPR008161; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR008160; Collagen.
InterPro; IPR008160; Clg helix.
InterPro; IPR008160; Collagen.
InterPro; IPR008160; Clg helix.
IPR061761; Collagen.
INTERPROSITE; PS01208; WWFC 1; PARTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GTPGLQCMPGERGCPGCPGPGPKGDKGEPGSSGVDGAPGKDGPRGPTGPFGPAGQPGDK 623
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                443
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPP----- 534
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSPGGPGSNGKPGPPGSQGETGRPGPPGSPGPRGQPGVMGFPGPKGNDGAPGKNGERGGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62.1%; Score 1905.5; DB 1; Length 1049;
larity 62.7%; Pred. No. 9.1e-71;
Conservative 36; Mismatches 161; Indels 9;
                                                                                                                                                                                                                                                                             NONHELLCAL REGION (N-TERMINAL).
TRIPLE-HELLCAL REGION.
NONHELLCAL REGION (C-TERMINAL).
HYDROXYLATION.
HYDROXYLATION.
HYDROXYLATION.
HYDROXYLATION.
HYDROXYLATION.
O-LINED (GAL...).
O-LINKED (GAL...).
                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERCHAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      93651 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                       950
1040
1041
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---GPPGPAGKEG
                                                                                                                                                                                                                                                                                                                                                                                                                       950
1040
1041
1049 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best Local Similarity
Matches 347; Conserv
                                                                                                                                                                                                                                                                   DISULFID
DISULFID
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              444
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                624
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          535
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
```

g

g ò 쉱 ò ద

à

ò

d à g ò g  $\delta$ a δ g

```
SEQUENCE OF 168-398.
MEDLINE=77134724; PubMed=557335;
Seyer J.M., Kang A.H.;
Seyer J.Eovalent structure of collagen: amino acid sequence of cyanogen
"Covalent structure of collagen: amino-terminal segment of type III collagen
of human liver.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Structure of cDNA clones coding for the entire prepro alpha 1 (III) chain of human type III procollagen. Differences in protein structure from type I procollagen and conservation of codon preferences."; Blochem. J. 260:509-516(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 399-727.

MEDLINE=79000343; PubMed=687591;
Seyer J.M., Kang A.H.;
"Covalent structure of collagen: amino acid sequence of five consecutive CNBr peptides from type III collagen of human liver.";
Biochemistry 17:3404-3411(1978).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    REVISION TO 1184.
MEDLINE=89098346; PubMed=3211760;
Molyneux K., Dalgleish R.;
Muman type III collagen 'variant' is a cDNA cloning artefact.";
Nucleic Acids Res. 16:11833(1988).
                                                                                                                                                                                                                                           Eukaryoča, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Primates, Catarrhini, Hominidae, Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         end.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the entire human alpha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     alpha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      'n
                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
TISSUDE-SKin fibroblast,
MEDLINE-893-30838; Pubmed-2764886;
Ala-Kokko L., Kontusaari S., Baldwin C.T., Kuivaniemi H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDINE=8019822; PubMed=6246925;
Seper J.M., Mainardi C., Kang A.H.;
Seper Extracture of collagen: amino acid sequence of
"Covalent structure of collagen: amino acid sequence of
"III)-CBS from type III collagen of human liver.";
Biochemistry 19:1583-1589(1980).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 [7]
SEQUENCE OF 950-1466 FROM N.A.
MEDLINE=88189827; Pubmed=3357782;
MARNOO B.S., Dalgleish R.;
"Human pro alpha 1(III) collagen: cDNA sequence for Nucleic Acids Res. 16:2337-2337(1988).
                      P02461, Q15112,
21-UTL-1986 (Rel. 01, Created)
01-UAN-1990 (Rel. 13, Last sequence update)
COCT-2003 (Rel. 42, Last annotation update)
Collagen alpha 1(III) chain precursor.
PRT; 1466 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              bank.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE OF 149-1225 FROM N.A.
MEDLINE=89386015; PubMed=2780304;
Janeczko R.A., Ramirez F.;
Vuclectide and amino acid sequences of (III) collagen.";
Nucleic Acids Res. 17:6742-6742(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              data
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Seyer J.M.;
Submitted (DEC-1977) to the PIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Biochemistry 16:1158-1164(1977)
STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE OF 728-964.
                                                                                                                                                                                                                       Homo sapiens (Human)
                                                                                                                                                                                                                                                                                                            NCBI_TaxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Prockop D.J.;
```

1

```
SEQUENCE OF 1176-1466 FROM N.A.
MEDLINB=85157600; PubMed=2579949;
Chu M.-L., Weil D., de Wet W.J., Bernard M.P., Sippola M., Ramirez F.;
"Isolation of cDNA and genomic clones encoding human pro-alpha 1
(III) collagen. Partial characterization of the 3' end region of the
   SEQUENCE OF 1065-1466 FROM N.A.
MEDLINE-BS087944; PubMed=6096827;
Loidl H.R., Brinker J.M., May M., Pihlajaniemi T., Morrow S.,
Rosenbloom J., Myers J.C.,
"Molecular cloning and carboxyl-propeptide analysis of human type III
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VARIANT AORTIC ANEURYSM ARG-303, AND VARIANT THR-668.

MEDLINE=93283988; PubMed=8514866;

Aroup G., Wu Y., Prockop D.J., Madhatheri S.L., Kleinert C.,
Earley J.J., Zhuan J., Noerrgaard O., Darling R.C., Abbort W.M.,
Cole C.W., Jaakkola P., Ryynaennen M., Pearce W.H., Yao J.S.T.,
Majamaa K., Smullens S.N., Gatalica Z., Ferrell R.E., Jimenez S.A.,
Jackson C.E., Michels V.V., Kaye M., Kuivaniemi H.;
"Sequencing G. CDNA from SO unrelated patients reveals that mutations in the triple-helical domain of type III procollagen are an infrequent cause of aortic aneurysms.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REVIEW ON VARIANTS.
MEDILINE-9755959; PubMed-9101290;
KULIATE-9755959; PubMed-9101290;
KULVANIGHIH., Tromp G., Prockop D.J.;
"Mutations in fibrillar collagens (types I, II, III, and XI), fibrilassociated collagen (type IX), and network-forming collagen (type X) cause a spectrum of diseases of bone, cartilage, and blood vessels."; Hum. Mutat. 9:300-315(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Toman D., Ricca G., de Crombrugghe B.;
Wucleotide sequence of a cDNA coding for the amino-terminal region
of human prepro alpha !(III) collagen.";
Nucleic Acids Res. 16:7201-7201(1988).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=91045136; PubMed=2235526; Zafarullah K., Kleinert C., Tromp G., Kuivaniemi H., Kontusaari S., Wu Y., Ganguly A., Prockop D.J.; Et o A polymorphism in exon 31 of the COL3A1 gene."; Nucleic Acids Res. 18:6180'6180(1990).
                                                                                                                                                                                                                                                                                                               MEDINE-81208139; PubMed-7016180; Seyer J.M., Kang A.H.; Seyer J.M., Kang A.H.; "Covalent structure of collagen: amino acid sequence of alpha I(III) -CB9 from type III collagen of human liver."; Biochemistry 20:2621-2627(1981).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE=89378752; PubMed=2777083;
Benson-Chanda V., Su M.W., Well D., Chu M.-L., Ramirez F.;
"Cloning and analysis of the 5' portion of the human type-III
gene 78:255-265(1989).";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE OF 1161-1200 FROM N.A.
MISDLINES 68187804; PubMed=3754462;
Miskulin M., Dalglaish R., Kluve-Beckerman B., Rennard S.I.,
Folstoshev P., Brantly M., Crystal R.G.;
Human Vype III collagen gene expression is coordinately mod
with the type I collagen genes during fibroblast growth.";
Biochemistry 25:1408-1413[1986].
                                                                                                                                                                                                              Nucleic Acids Res. 12:9383-9394 (1984)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Clin. Invest. 91:2539-2545(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Biol. Chem. 260:4357-4363(1985)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TISSUE=Placenta;
MEDLINE=88303360; Pubmed=3405773;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE OF 1-170 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE OF 1-176 FROM N.A.
                                                                                                                                                                                                                                                                                        SEQUENCE OF 965-1200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VARIANT THR-698.
                                                                                                                                                                                procellagen.";
REEL STANDER S
```

```
'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GANGAPGLRGGAGEPGKNGAKGEPGPGPRGERGIPGVPGAKGEDGKDGSPGEPGANGLP 479
            MEDDINE=51056145; PubMed=2243125;
Kontusaari S., Tromp G., Kuivaniemi H., Romanic A.M., Prockop D.J.;
"A mutation in the gene for type III procollagen (COL3A1) in a family
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "A single base mutation in the gene for type III collagen (COL3A1) converts glycine 847 to glutamic acid in a family with Ehlers-Danlos syndrome type IV. An unaffected family member is mosaic for the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                      MEDLINE-89109135; PubMed=2492273;
Tromp G., Kuivaniemi H., Shikata H., Prockop D.J.;
Tromp G., Kuivaniemi H., Shikata H., Prockop D.J.;
The single base mutation that substitutes serine for glycine 790 of
the alpha I (III) chain of type III procollagen exposes an arginine
and causes Ellers-Danlos syndrome IV.";
J. Biol. Chem. 264:1349-1352(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                acid
in a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           H.;
                                                                                                                                                    MEDLINE-94016385; PubMed-8411057; Richards A.U., Narcisi P., Lloyd J.C., Ferguson C., Pope F.M.; Richards A.U., Narcisi P., Lloyd J.C., Ferguson C., Pope F.M.; The substitution of glycine 661 by arginine in type III collagen produces mutant molecules with different thermal stabilities and causes Ehlers-Danlos syndrome type IV.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                VARIANT EDS-IV VAL-960.
MEDLINE-95268429; PubMed-7749417;
Tromp G., de Paepe A., Nuytinck L., Madhatheri S.L., Kuivaniemi B. Subritution of valine for glycine 793 in type III procollagen :Ehlers-Danlos syndrome type IV.";
Hum. Mutat. S:179-181(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VARIANT EDS-IV GLU-1014.
MEDLINE-92316511; PubMed-1352273;
Richards A.J., Ward P.N., Narcisi P., Nicholls A.C., Lloyd J.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Characterisation of a glycine to valine substitution at amino position 910 of the triple helical region of type III collagen patient with Ehlers-Danlos syndrome type IV."; of Genet. 28:458-463(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=90037070; PubMed=2808425; Tromp G., Kuivaniemi H., Scolle C.A., Pope F.M., Prockop D.J.; Stomp G., Kuivaniemi H., Scolle C.A., Pope F.M., Prockop D.J.; Stomp G., Kuivaniemi H., Scolle C.A., Pope F.M., Prockop D.J.; Lhe codon for glycine 883 to aspartate in a mild variant of Ehlers-Danlos syndrome IV.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE-91374480; PubMed=1895316;
Richards A.J., Lloyd J.C., Ward P.N., de Paepe A., Narcisi P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61.9%; Score 1901; DB 1; Length 1466; 63.1%; Pred. No. 1.7e-70; ive 37; Mismatches 159; Indels. 6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=93022543; PubMed=1357232;
Johnson P.H., Richards A.J., Pope F.M., Hopkinson D.A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Biol. Chem. 264:19313-19317(1989)
                                                                             with aortic aneurysms.";
J. Clin. Invest. 86:1465-1473(1990)
VARIANT AORTIC ANEURYSM ARG-786
                                                                                                                                                                                                                                                              J. Med. Genet. 30:690-693(1993)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hum. Genet. 89:414-418(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VARIANT EDS-IV ASP-1050.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VARIANT EDS-IV GLU-1173.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VARIANT EDS-IV VAL-1077
                                                                                                                                       VARIANT EDS-IV ARG-828
                                                                                                                                                                                                                                                                                                     VARIANT EDS-IV SER-957
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Simi
Matches 345;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           mutation."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pope F.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pope F.M.;
                                                                                                                                                                                                                                                                                  20]
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
```

Search completed: September 24, 2004, 11:07:24 Job time : 14.7264 secs This Page Blank (uspto)

GenCore version 5.1.6 Copyright (c) 1993 - 2004 Compugen Ltd.

OM protein - protein search, using sw model

September 24, 2004, 11:06:55; Search time 74.4117 Seconds (without alignments) 2065.614 Million cell updates/sec Run on:

Title: Perfect score: Sequence:

US-10-658-989A-4 3070 I GSEGPEGVRGEPGPPGPAGA......PGPSGDAGPPGPPGKEG 544

BLOSUM62 Gapop 10.0 , Gapext 0.5 Scoring table:

1586107 seqs, 282547505 residues

Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0 Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

Database :

A Geneseq 29Jan04:\*

1: geneseqp1980s:\*

2: geneseqp2000s:\*

4: geneseqp2001s:\*

5: geneseqp2001s:\*

6: geneseqp2003s:\*

7: geneseqp2003ss:\*

8: geneseqp2003ss:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Description	Aay84541 Amino aci	4	m	Ŋ	0	920	Collag		_	538	Ade87057 Human pan	N	Aar89471 Collagen/	Human	Abg93947 Human pol	Human	Aab82454 Human pro	Aau14136 Human nov	Abb90764 Human Tum	Abp68610 Human pan	Abu54471 Human tum	Abr47417 Breast ca	N	1142 Human	Add45059 Human Pro
DI	AAY84541	AAY84544	AAY84403	AAR89472	AAY84540	ADE87050	AAR89469	AAY84537	AAR89470	AAY84538	ADE87057	ADE87062	AAR89471	AAY56800	ABG93947	AAW68485	AAB82454	AAU14136	ABB90764	ABP68610	ABU54471	ABR47417	ABR92064	ADD14142	ADD45059
ength DB	057	057	058	101	1107 3	161	9	9	7.1	7	1211 7	9	38	11	19	54	1464 4	54	54	54	54	4.	54	54	1464 7
% Query Mátch Length	ıφ	9.96	.9.96	Ġ	96.6	ó	Ġ	ů.	ů.	ů.	Ġ	ů.	ġ.	ů.	9	ė	ė	ė.	9	9	9	ė	Ġ.	Ġ	
Score	96	96	96	96	2966	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
Result No.	74	7	m	4	ഗ	ø	7	œ	O	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

Human Pro Human Pro Human ban	Amino aci Bovine al	E 71	r Prot	Rat Prote Rat Prote	Rat Prote Mouse rec	Mouse pol Porcine a	Collagen	Human col	Collagen	Amino aci
Add45055 Add45051 Ade87048		Ade87051 Add45053	Add48341	Add45049 Add48337	Add48345 Aay06240	Abg93948 Aae02535	Aar71701	Aae16475	Abb80733	Abb09625
ADD45055 ADD45051 ADE87048	AAY84539 AAE02532	ADE87051 ADD45053	ADD48341	ADD45049 ADD48337	ADD48345 AAY06240	ABG93948	AAR71701	AAE16475	ABB80733	ABB09625
~~~	w 4	r r 1	- 1	~ ~	۲ ۸	ณ 4	201	n n	Ŋ	w
1464	38 9	50 4	4. 4. U. D.	1453	1453	N 4	1341	1341	1341	1341
96.9	96.4	93.6	9 9 9 9 . 6	93.6 93.6	93.6	mr	0.00		•	6.06
2966 2966 2966	2956 2958 2936	2920	2872	2872	2872	2857	791.	2791.5	2791.5	2791.5
26 27 28	9 6 6	333	м м и 4	32 30 30	37	9 6	. 4.	1. 4. 2. w	44	45

## ALIGNMENTS

Extracellular matrix protein; self aggregation; hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation. Amino acid sequence of a human collagen 1 (alpha1) protein. AAY84541 standard; protein; 1057 AA (first entry) 25-JUL-2000 

Homo sapiens.

EP992586-A2.

12-APR-2000.

99EP-00119184. 07-OCT-1999; 98US-00169768. 09-OCT-1998;

(USSU ) US SURGICAL CORP.

Connolly Zhang G, Gruskin EA, Buechter DD,

콗

WPI; 2000-259138/23. N-PSDB; AAA12502.

Production of extracellular matrix proteins containing 4-trans-hydroxyproline results in native self aggregating proteins, useful on medical implants.

Disclosure; Fig 27A-E; 260pp; English.

The specification describes a method for producing an extracellular matrix protein or its fragment. The extracellular matrix protein is expable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by that cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the corporating the nucleic acid sequence into the cell; and contacting the selected from the group consisting of trans-4-hydroxyproline and ocid, selected from the group consisting of trans-4-hydroxyproline and selected into the extracellular matrix protein. The

ö

Production of extracellular matrix proteins containing 4-trans-hydroxyproline results in native self aggregating proteins, useful

Example 10; Fig 39A-E; 260pp; English

medical implants.

¥

Connolly

Ö Zhang

Buechter DD,

Gruskin EA,

2000-259138/23.

N-PSDB; AAA12503

(USSU ) US SURGICAL CORP

99EP-00119184 98US-00169768

07-OCT-1999; 09-OCT-1998;

EP992586-A2

```
ô
method may be used to make host cells assimilate and incorporate trans-4-
nydroxyproline into proteins. This is especially useful in the
recombinant production of proteins such as colladen, fibrinogen and
fibronectin whose ability to self aggregate and produce functional
proteins depends on the post translational hydroxylation of proline. The
method is also useful in studying the structure and function of
polypeptides which do not normally contain trans-4-hydroxyproline. The
present sequence represents a human collagen I (alphal) protein, which
may be produced using the method of the invention
                                                                                                                                                                                                                                                                            260
                                                                                                                                                                                                                                                                                                                                                                                       GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               480
                                                                                                                                                                                                                                                                                                         GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                          320
                                                                                                                                                                                                                                                                                                                                                                         180
                                                                                                                                                                                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAFGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        740
                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                             1 GSEGPEGVRGEPGPPGPAGPAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                   GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GAPGLQGMPGERGAAGLPGPKGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSPGSPGFDGKTGPPGFAGDGRPGPPGPPGARGOAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                    .
.
                                                                                                                                                                                     Length 1057;
                                                                                                                                                                                                                Indels
                                                                                                                                                                                  96.6%; Score 2966; DB 3;
95.6%; Pred. No. 2.7e-169;
ive 21; Mismatches 3;
                                                                                                                                                                                                  Best Local Similarity 95.6
Matches 520; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 744
                                                                                                                                                      Sequence 1057 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                  321
                                                                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                             381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 741
                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        481
 88888888888888
                                                                                                                                                                                                                                                                                                                              음
                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                    음
                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                               \dot{\delta}
                                                                                                                                                                                                                                                                                                                                                                                          OD
                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                      d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ∂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Dp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8 8
```

```
The specification describes a method for producing an extracellular matrix protein or its fragment. The extracellular matrix protein is capable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by that cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-hydroxyproline and incorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins. This is especially useful in the recombinant production of proteins such as collagen, fibrinogen and production of proteins such as collagen, fibrinogen and proteins depends on the post translational hydroxylation of proline. The method is also useful in studying the structure and function of proteins represents when a contain trans-4-hydroxyprolline. The processing the properties and production of proteins contain trans-4-hydroxyprolline. The processing contain trans-4-hydroxyprolline in the processing trans-4-hydroxyprocesine in the processing trans-4-hydroxyprocessing trans-4-hydr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPPGAVGPACKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVPGDLGAPGPSGARGEPGFFGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GSEGPQGVRGEPGPPGPAGAAGPACNPGADGQPCAKGANGAPGIAGAPGFPGARGPSGPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       441 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (alphal) helical region,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    96.6%; Score 2966; DB 3; Length 1057; 95.6%; Pred. No. 2.7e-169; ive 21; Mismatches 3; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 which may be produced using the method of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        represents human collagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 1057 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              present sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Sim:
Matches 520;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               501
8X8X#X#X#X#X#X####X#X####X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ਨੇ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
```

Extracellular matrix protein; self aggregation; hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation.

Homo sapiens

A human collagen 1 (alpha1) protein helical region.

(first entry)

25-JUL-2000

Æ

AAY84544 standard; protein; 1057

RESULT 2 AAY84544

ö

Gaps

ö

Indels

3,

21; Mismatches

```
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              745
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-OCT-1996
    520;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Synthetic
                                                   н
                                                                                                                                        61
                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                322
                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                       382
                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             622
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAR89472;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Key
Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Peptide
    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 4
AAR89472
                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                              ద
                                                                                                                                                                                                                                                                                                                                                                                                                 à
                                                                                                                                                                                                                                                                                                                                                                                                                                                            요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                     8
                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The present sequence represents a human type 1 (alphal) collagen protein. Peptides derived from the protien were used to demonstrate incorporation of 3,4-dehydro-L-prolline into the peptide, using the method of the invention. The specification describes a method for the incorporation of non-natural amino acid into a polypeptide. The method comprises reacting at least one 3,4-dehydroprolline residue in the polypeptide with an epoxyprolline residue. The method is used for studying the effects of non-natural amino acids on structure and function of polypeptides. The method is also useful for commercial production of collagen or mussel adhesive proteins (which are useful as bloadhesives), and for incorporating a wide variety of groups, including therapeutic ligands and biological probes,
                                                                                                                                                                540
                                                                        480
                                                                                                                  680
                                                                                                                                                                                        GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA 740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Alphal collagen; 3,4-dehydro-L-proline; epoxidation; 3,4-epoxyproline; collagen; mussel adhesive protein; bioadhesive.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for
                          GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPPAGAPGDK
                                                                                                 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                           GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                      GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
Incorporating non-natural amino acid into polypeptide, useful e.g. production of bioadhesives, by epoxidation or substitution of dehydroproline residues.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Amino acid sequence of human type 1 (alpha1) collagen polypeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2966; DB 3; Length 1058;
Pred. No. 2.7e-169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Buechter DD;
                                                                                                                                                                                                                                                                                                                                                                                                                 AAY84403 standard; protein; 1058 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Disclosure; Fig 6; 66pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          98US-0099652P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99WO-US020462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 96.6%;
95.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (USSU ) US SURGICAL CORP.
(PAOL/) PAOLELLA D N.
(GRUS/) GRUSKIN E A.
(BUEC/) BUECHTER D D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WPI; 2000-271051/23.
N-PSDB; AAZ99843.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                 744
                                                                                                                                                                                                                                                     GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1058 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO200014201-A1
                                                                                                                                                                                                                                                                                                      GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Paolella DN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              07-SEP-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          09-SEP-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16-MAR-2000.
                             561
                                                                                                                                                                                                       681
                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAY84403;
                                                                      421
                                                                                                               521
                                                                                                                                                              481
                                                                                                                                                                                                                                                       541
                                                                                                                                                                                                                                                                                                 741
                                                                                                                                                                                                                                                                                                                                                                     RESULT 3

RAY84403

RAY8403

RAY84403

RAY8440
                                                                 දු පු
                                                                                                                                                                                           q
                                                                                                                                                                                                                                      ð
                                                                                                                                                         à
                                                                                                                                                                                                                                                                                              g
```

```
480
                              261
                                                                   120
                                                                                                      321
                                                                                                                                          180
                                                                                                                                                                             381
                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                    441
                                                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                                                         501
                                                                                                                                                                                                                                                                                                                                                              360
                                                                                                                                                                                                                                                                                                                                                                                                 561
                                                                                                                                                                                                                                                                                                                                                                                                                                     420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     741
9
                     442 GPPGAVGPAGKDGEAGAQGPPGPAGPAGPRGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                                                                 GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNGAKGDAGAGAPGSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       682 GPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA
                                                                                          262 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                              GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAXGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                          GAPGLOGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLIGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                     GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                          GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                         GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGPPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                  GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                         GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                     GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGOPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Transforming growth factor, TGF-beta-1; collagen IA; osteogenesis; bone formation; tissue repair; fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "amino acids P46 to G93 of mature decorin"

    1057
    /label= Collagen-IA
    /note= "collagen IA alpha-helical domain"

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     acid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                'note= "unidentified amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 note= "unidentified amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Collagen/decorin(aa46~93) fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /label= Linker_peptide
1060. .1107
/label= Decorin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAR89472 standard; protein; 1107 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /label= Link
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   887
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CA2151547-A.
```

```
Sequence 1107 AA;
                                                                                             ô
                                                                                                                                                                 Chimaeric DNA encoding protein contg. extracellular matrix protein domain - and cellular regulatory factor domain, partic. useful as osteogenic agents, also related vectors, transformed cells and chimaeric proteins.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                680
                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                     A fusion protein (AAR89472) comprises the alpha-helical region of human collagen I(a) linked to amino acids 46-93 of human mature dermatan sulphate proteoglycan (decorin). It can be expressed in Escherichia collarasformants carrying a vector incorporating a chimeric gene (AAT16518) coding for the fusion. The decorin binds to type I collagen and thus affects Elbril formation. It inhibits the cell attachment-promoting activity of collagen and fibrinogen by binding to such molecules near their cell binding sites. The collagen moiety provides an integral substratum or scaffolding for the decorin. The fusion protein acts to reduce scarring of healing tissue
                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSEGPQGVRGEPGPPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       881 GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPPGDPGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPPGPEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GAPGLOGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                        .
0
                                                                                                                                                                                                                                                                                                                                                                                                  Length 1107;
                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                96.6%; Score 2966; DB 2;
95.6%; Pred. No. 2.8e-169;
tive 21; Mismatches 3;
                                                                                                                                                                                                                  Disclosure; Fig 8; 59pp; English
                                  95CA-02151547
                                                         94US-00259263
                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                (USSU ) US SURGICAL CORP
                                                                                                         Espino P;
                                                                                                                              WPI; 1996-140144/15.
N-PSDB; AAT16518.
                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity
Matches 520; Conserv
                                                                                                                                                                                                                                                                                                                                                                          Sequence 1107 AA;
                                  12-JUN-1995;
                                                         10-JUN-1994;
           11-DEC-1995
                                                                                                         Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       481
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \delta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
```

```
The specification describes a method for producing an extracellular matrix protein of capable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by the cell for naturally occurring ocdons not preferred by the cell; in corporating the nucleic acid sequence into the cell; and contacting the incorporating the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-hydroxyproline and incorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins. This is especially useful in the recombinant production of proteins such as collagen, fibrinogen and proteins depends on the post trans-stational hydroxylation of proteins. The method is also useful in studying the structure and functional proteins which do not normally contain trans-4-hydroxyproline. The present sequence represents a chimmeric collagen (alphal)/decorin protein, which may be produced using the method of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Extracellular matrix protein; self aggregation; hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Amino acid sequence of a chimeric collagen 1 (alphal)/decorin protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Production of extracellular matrix proteins containing 4-trans-
hydroxyproline results in native self aggregating proteins, useful on
medical implants.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Connolly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Gly encoded by GCT"
                                                                                                                                                                                                                                                               AAY84540 standard; protein; 1107 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        σ̈
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 24; Fig 18; 260pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Zhang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99EP-00119184.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98US-00169768,
                                                                                                                                                                                                                                                                                                                                                                                                           25-JUL-2000 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gruskin EA, Buechter DD,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 2000-259138/23.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Misc-difference 858
                                                                       741 GKEG 744
541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB; AAA12500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          collagen; fibrindecorin; chimera
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Homo sapiens
Unidentified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 07-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             09-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EP992586-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12-APR-2000
                                                                                                                                                                                                                                                                                                                                       AAY84540;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Chimeric
                                                                                                                                                                                   RESULT 5
```

. Db

g à 8 8 8

ద

ò ద ò 8 8 d 8 8

8

8 ద

8

```
This invention relates to novel nucleic acids and proteins present in normal and neoplastic pancreatic cells. Pancreatic cancer is a common cause of cancer death worldwide, therefore accurate methods of diagnosis and treatment are required. Compounds which modulate the proteins of the invention may have cytostatic activity and the protein and DNA sequences of the invention may be useful for the development of a vaccine or in gene therapy. The composition and methods are useful in diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer and non-cancerous disease states of the pancreas. The present sequence is that of a human pancreatic protein of the invention.
                                      New pancreatic specific nucleic acid molecule or protein for diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer onon-cancerous disease states of the pancreas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  59 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGOPGAKGANGAPGIAGAPGFPGARGPSGPO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            299 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAFGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        419 GAPGLOGMPGERGAAGLPGPKGDAGPKGADGSPGKDGVRGLTGP1GP1GPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                           GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKKGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGPPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGAVGPACKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        479 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                          Length 11617;
                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                      Query Match 96.6%; Score 2966; DB 7; Sest Local Similarity 95.6%; Pred. No. 2.9e-169; Matches 520; Conservative 21; Mismatches 3;
                                                                                                         SEQ ID NO 510; 635pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        standard; protein; 1169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 602
                                                                                                                                                                                                                                                                                                                                     Sequence 1161 AA;
       N-PSDB; ADE87387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-OCT-1996
                                                                                                           Claim 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                             н
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 599
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAR89469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAR89469;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 7
AAR89469
       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HXXXH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                        ö
                                                                                                                                                                                              180
                                                                                      260
                                                                                                                          120
                                                                                                                                                             320
                                                                                                                                                                                                                               380
                                                                                                                                                                                                                                                                   240
                                                                                                                                                                                                                                                                                                  440
                                                                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                                                                                          360
                                                                                                                                                                                                                                                                                                                                                                                                                                           560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               620
                                                         9
                                                                          GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPO
                                                                                                                                              GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQCPPGPAGEEGKRCARGEPGPTGLP
                                                                                                                                                                                                                                                                                   GSPGSPGFDGKTGPPGPAGQDGRPGPPGARGQAGVMGFPGFKGARGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                            GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                        GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                          GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                        GPPGERGGPGSRGFPGADGVAGPRGPAGERGSPGPAGPRGSPGEAGRPGEAGLPGALT
                                                                                                                                                                                                                                                                                                                                 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                      GVPGDLGAPGPSGARGEPGFFGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                     1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPCAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                             GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                        Gaps
                        ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 neoplastic pancreatic cell; pancreatic cell; pancreatic cancer;
                      Indels
 Pred. No. 2.8e-169;
L; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Human pancreatic cell protein seguence SegID510,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        cancer death, cytostatic, vaccine, gene therapy, non-cancerous pancreas disease, human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ADE87050 standard; protein; 1161
 ilarity 95.6%; Pr
Conservative 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              19-DEC-2002; 2002WO-US040655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21-DEC-2001; 2001US-0342768P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (DIAD-) DIADEXUS INC
Best Local Similarity
Matches 520; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 2003-587286/55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKEG 744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO2003060145-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Liu C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29-JAN-2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            24-JUL-2003
                                                                                                                                                         261
                                                                                                                                                                                                                            321
                                                                                      201
                                                                                                                        61
                                                                                                                                                                                          121
                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                381
                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                   441
                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                       501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADE87050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sun Y,
```

RESULT 6 ADE87050

ö

Gaps

118 120 178 180 238 240 298 300 358 360 418 420 478 480

9

540 538

598

Sep 24 11:45:39 2004

Fri

```
GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 22; Fig 13; 260pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 2000-259138/23.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Misc-difference 890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Misc-difference 677
                                                                                                                                                                                                                     541 GKEG 544
                                                                                                                                                                                                                                        744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    N-PSDB; AAA12497
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                  Homo sapiens
Unidentified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           09-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      07-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EP992586-A2
        241
                                                                                         361
                                                                                                                                  421
                                                                                                                                                                          481
                                                                                                                                                                                                681
                                                                                                                                                                                                                                        741
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Chimeric
                                                                                                                                                                                                                                                                                 AAY84537
                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                    d
                                                                                                                                                                                           Op
Op
                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                        d
                      g
                                               ò
                                                                                        ò
                                                                                                         임
                                                                                                                            ò
                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                   A fusion protein (AAR89469) comprises the alpha-helical region of human collagen I(a) linked to the human mature bone morphogenic protein 2B (BMP2B). It can be expressed in Escherichia coli transformants carrying a vector incorporating a chimeric gene (AAT16515) coding for the fusion. The BMP moiety induces osteogenesis, while the collagen moiety provides an integral substratum or scaffolding for the BMP and cells involved in reconstruction and growth. The fusion protein provides sustained release and delivery of BMP to a target tissue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                       Chimaeric DNA encoding protein contg. extracellular matrix protein domain - and cellular regulatory factor domain, partic. useful as osteogenic agents, also related vectors, transformed cells and chimaeric proteins.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      201 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              261 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
                            Bone morphogenic protein 2B; BMP-2B; collagen IA; osteogenesis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 1169;
                                                                               Location/Qualifiers
1. .1057
/label= Collagen-IA
/note= "collagen IA alpha-helical domain"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            'n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        96.6%; Score 2966; DB 2;
95.6%; Pred. No. 2.9e-169;
tive 21; Mismatches 3;
                                                                                                                                   'note= "unidentified amino acid"
                                                                                                                                                       amino acid"
                                                                                                                                                                                                            /note= "human mature BMP-2B"
                                                                                                                                                                 1058. .1059
/label= Linker_peptide
1060. .1169
/label= BMP-2B
                                                                                                                                                     'note= "unidentified
                                                                                                                                                                                                                                                                                                                                                                                                                                     Disclosure, Fig 5, 59pp, English.
          Collagen/BMP-2B fusion protein.
                                                                                                                                                                                                                                                                           95CA-02151547
                                                                                                                                                                                                                                                                                               94US-00259263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity 95.6%
Matches 520; Conservative
                                                                                                                                                                                                                                                                                                                  (USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                                                                                                       Gruskin EA, Espino P;
                                                                                                                                                                                                                                                                                                                                                             WPI; 1996-140144/15.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 1169 AA;
                                                                                                                                                                                                                                                                                                                                                                      N-PSDB; AAT16515
                                                                                                                         Misc-difference
                                                                                                                                              Misc-difference
                                         fusion protein.
                                                                                                                                                                                                                                                                           12-JUN-1995;
                                                                                                                                                                                                                                                                                               10-JUN-1994;
                                                                                                                                                                                                                                 CA2151547-A
                                                                                                                                                                                                                                                     11-DEC-1995
                                                            Synthetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61
                                                                                                                                                                   Peptide
                                                                                          Domain
                                                                                                                                                                                         Domain
g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
```

```
680
                                                                                                                                                                                                                                                                                                                                                                                                                     740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Extracellular matrix protein; self aggregation; hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation; ss. bone morphogenic protein; BMP-2B; chimera.
               500
                                                                                                                 560
                                                                                                                                                                 420
                                                                                                                                                                                                                 620
                                                                                                                                                                                                                                                                   480
                                                                                                                                                                                                                                                                                                                                                                  GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                  301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Production of extracellular matrix proteins containing 4-trans-hydroxyproline results in native self aggregating proteins, useful on medical implants.
                                                                                                                                                                                                                                                                                                                                                                                                  GPAGPAGPPGPPGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPP
441 GPPGAVGPAGKDGBAGAGPPGPAGPAGPAGBAGSPAGSPGFQGLPGPAGPAGFPGEAGKPGEQ
                                                                                            GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                   GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Amino acid sequence of a chimeric collagen 1 (alpha1)/BMP-2B protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ë
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "unspecified amino acid encoded by CT"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note= "unspecified amino acid encoded by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Connolly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /note= "Ala encoded by G"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAY84537 standard, protein, 1169 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ω̈
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Zhang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   98US-00169768.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     25-JUL-2000. (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Buechter DD,
```

-

us-10-658-989a-4.rag

Transforming growth factor; TGF-beta-1; collagen IA; osteogenesis; bone formation; tissue repair; fusion protein.

Synthetic

The specification describes a method for producing an extracellular matrix protein or its fragment. The extracellular matrix protein is capable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid sequence for expression in the cell by substitution of codons preferred by that cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-hydroxyproline to allow at least one of the amino acids to be assimilated into the cell and incorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins. This is especially useful in the recombinant production of proteins. This is especially useful in the recombinant production of proteins under a collagen, fibrinogen and fibronectin whose ability to self aggregate and produce functional proteins depends on the post translational hydroxylation of proline. The method is also useful in studying the structure and function of polypeptides which do not normally contain trans-4-hydroxyproline. The method is processing a chimeric collagen I (alpha1)/bone morphogenic procesin-2B (bmp-2b) protein, which may be produced using the method of the invention

Key Domain

Location/Qualifiers 1. 1057 /label= Collagen-IA /note= "collagen IA alpha-helical

domain"

'note= "unidentified amino Misc-difference

/label= TGF-beta-1 /note= "human mature TFF-beta-1" 1058. .1059 /label= Linker\_peptide 1060. .1171 /label= TGF-beta-1

CA2151547-A.

95CA-02151547. 12-JUN-1995;

WPI; 1996-140144/15. N-PSDB; AAT16516.

Chimaeric DNA encoding protein contg. extracellular matrix protein dom:
- and cellular regulatory factor domain, partic. useful as osteogenic agents, also related vectors, transformed cells and chimaeric proteins.

Disclosure; Fig 6; 59pp; English

A fusion protein (AAR89470) comprises the alpha-helical region of human collagen I(a) linked to the human mature transforming growth factor beta-(TGF-beta-1). It can be expressed in Escherichia coli transformants carrying a vector incorporating a chimeric gene (AAT16516) coding for the fusion. The TGF-beta-moiety increases efficacy of the body's normal soft tissue repair response and also induces osteogenesis. The collagen moiety provides an integral substratum or scaffolding for the TGF and cells involved in reconstruction and growth. The fusion protein provides sustained release and delivery of TGF-beta-1 to a target tissue 

Sequence 1171 AA;

Gaps . Length 1171; 3; Indels 96.6%; Score 2966; DB 2; 95.6%; Pred. No. 2.9e-169; iive 21; Mismatches 3; Query Match
Best Local Similarity 95.6
Matches 520; Conservative

ö

260 201 GSEGPÇGVKGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGAKGPSGPQ GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE Н

> 셤 ò g ò

180 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 121

AAR89470 standard; protein; 1171 AA. RESULT 9
AAR89470
ID AAR8

180 240 440 260 GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPPGBAGAPGDK 620 480 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPAGPPGAPGQPGAKGEPGDAGAKGDAGPP 680 540 GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA 740 260 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120 380 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300 500 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAE 360 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420 9 GPGGPPGPKGNSGEPGAPGSKGDIGAKGEPGPVGVQGPPGPAGEEGKKGARCEPGPTGLP GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT GSPGSPGRDGKTGPPGPAGQDGRPGPPGARQQAGVMGFPGPKGAAGEPGKAGERGVP 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE GPPGERGGPGSRGFPGADGVAGPXGPAGERGSPGPAGPXGSPGEAGRPGEAGLPGAKGLT GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP Gaps ö 96.6%; Score 2966; DB 3; Length 1169; 95.6%; Pred. No. 2.9e-169; ive 21; Mismatches 3; Indels 0; Query Match Best Local Similarity 95.64 Matches 520; Conservative 744 GKEG 544 261 321 261 201 61 181 381 241 441 301 501 361 621 481 581 541 121 421 741 셤 ò 8 8 셤 g 8 8 8 음 충염 à \$ B \$ ठ 용

(first entry) 01-OCT-1996 AAR89470;

Collagen/TGF-beta-1 fusion protein.

'note= "unidentified amino acid" 887 Misc-difference

Peptide

Sequence 1169 AA;

94US-00259263 10-JUN-1994;

(USSU ) US SURGICAL CORP

Espino P; Gruskin EA,

```
544
                                                                                                                                                                                                                        Sequence 1171 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                - 0
0
- 0
- 0
- 0
                                                                                                                                                                                                                                                                                                 201
                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                     261
                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                         321
                                                                                                                                                                                                                                                                                                                                                                                           181
                                                                                                                                                                                                                                                                                                                                                                                                             381
                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                  441
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          561
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              621
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     741
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 11
ADE87057
ઠે
                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                   ద
                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                       셤
                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        요
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                          360
                                                                                                                                                                  480
                                   440
                                                                                                                                                                                                                                                                                                                                                                                 Extracellular matrix protein; self aggregation; hydroxylated proline; trans-4-hydroxyproline; 3-hydroxyproline; recombinant protein production; collagen; fibrinogen; fibronectin; post translational hydroxylation; ss. transforming growth factor-betal; TGF-betal; chimera.
                                                      300
                                                                        500
                                                                                                            260
                                                                                                                             420
                                                                                                                                               620
                                                                                                                                                                                    680
                                                                                                                                                                                                      540
                                                                                                                                                                                                                        740
GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 380
                                                      GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                441 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGFPGEAGKPGEQ
                                                                                          GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                        501 GVPGDLGAPGPSGARGERGFPGERGVQGPPGFAGPRGANGAPGNDGAKGDAGAPGSQ
                                                                                                                                                                                                                 681 GPAGPAGPGDIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPA
                                   GSPGSPGPDGKTGPPGPAGQDGRPGPPGPRGARGQAGVMGRPGPKGAAGEPGKAGERGVP
                                                                                                                                                                  GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                            GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                       GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Production of extracellular matrix proteins containing 4-trans-
hydroxyproline results in native self aggregating proteins, useful on
medical implants.
                 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGPPGPKGAAGEPGXAGERGVP
                                                                                                                             GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK
                                                                                                                                               561 GAPGLOGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                chimeric collagen 1 (alpha1)/TGF-betal protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   꾻
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Connolly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note= "Gly encoded by
                                                                                                                                                                                                                                                                                                           Ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Zhang G,
                                                                                                                                                                                                                                                                                                         AAY84538 standard; protein; 1171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               98US-00169768
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99EP-00119184
                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Buechter DD,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (USSU ) US SURGICAL CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 2000-259138/23.
N-PSDB; AAA12498.
                                                                                                                                                                                                                                          544
                                                                                                                                                                                                                                                           744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Key
Misc-difference
                                                                                                                                                                                                                                                            GKEG
                                                                                                                                                                                                                                          GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                Homo sapiens.
Unidentified.
Chimeric.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             07-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               09-OCT-1998;
                                                                                                                                                                                                                                                                                                                                               25-JUL-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12-APR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EP992586-A2
                                   381
                                                      241
                                                                                                                                                                                                                                          541
                181
                                                                                          301
                                                                                                                             361
                                                                                                                                                                  421
                                                                                                                                                                                    621
                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                             AAY84538;
                                                                                                                                                                                                                                                                                        RESULT 10
                                                                                                                                                                                                                                                                                                ð
                              8
                                                    ò
                                                                   엄
                                                                                        ठ
                                                                                                          g
                                                                                                                            à
                                                                                                                                            g
                                                                                                                                                                 ò
                                                                                                                                                                                  Db
                                                                                                                                                                                                     ò
                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                       g
```

```
capable of self aggregating in a cell which does not ordinarily capable of self aggregating in a cell which does not ordinarily hydroxylated prolines. The method comprises optimising a nucleic acid capable of sequence for expression in the cell by substitution of codons preferred by that cell for naturally occurring codons not preferred by the cell; incorporating the nucleic acid sequence into the cell; and contacting the cell with a hypertonic growth medium containing at least one amino acid, selected from the group consisting of trans-4-hydroxyproline and 3-chydroxyproline to allow at least one of the amino acids to be assimilated into the cell and incorporated into the extracellular matrix protein. The method may be used to make host cells assimilate and incorporate trans-4-hydroxyproline into proteins. This is especially useful in the recombinant production of proteins such as collagen, fibrinogen and fibronectin whose ability to self aggregate and produce functional corputation also useful in studying the structure and function of proline. The method is also useful in studying the structure and function of propersents chameric collagen! (alphal)/transforming growth factor-betal (TGF-betal) protein, which may be produced using the method of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  440
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    560
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           620
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      680
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             740
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPPGAVGPACKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPGGPPGPKGNSGEPCAPGSKGDTGAKGEPGPVCVQGPPGPAGEEGKRGARGEPGFTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GAPGLOGMPGERGAAGLPGPKGDRGPKGADGSPGKDGVRGLTGP1GPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLDGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGWGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPAGPAGPPGPIGNVGAPGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                   specification describes a method for producing an extracellular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 96.6%; Score 2966; DB 3; Length 1171; Best Local Similarity 95.6%; Pred. No. 2.9e-169; Matches 520; Conservative 21; Mismatches 3; Indels 0
Claim 23; Fig 15; 260pp; English.
```

us-10-658-989a-4.rag

Q

420

781

721

480

```
481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPA 540
                                                                                                                                                                                                                                                                                                                                                                   This invention relates to novel nucleic acids and proteins present in normal and neoplastic pancreatic cells. Pancreatic cancer is a common cause of cancer death worldwide, therefore accurate methods of diagnosis and treatment are required. Compounds which modulate the proteins of the invention may have cycostatic activity and the protein and DNA sequences of the invention may be useful for the development of a vaccine or in gene therapy. The composition and methods are useful in diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer and non-cancerous disease states of the pancreas. The present sequence is that of a human pancreatic protein of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     New pancreatic specific nucleic acid molecule or protein for diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer on non-cancerous disease states of the pancreas.
GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           neoplastic pancreatic cell; pancreatic cell; pancreatic cancer; cancer death; cytostatic; vaccine; gene therapy; non-cancercus pancreas disease; human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      96.6%; Score 2966; DB 7;
larity 95.6%; Pred. No. 3e-169;
Conservative 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Human pancreatic cell protein sequence SeqID522
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 12; SEQ ID NO 522; 635pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ą
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADE87062 standard; protein; 1226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        19-DEC-2002; 2002WO-US040655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  21-DEC-2001; 2001US-0342768P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (DIAD-) DIADEXUS INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
Matches 520; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WPI; 2003-587286/55.
N-PSDB; ADE87403.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 1226 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WO2003060145-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Liu C;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             902 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Homo sapiens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              29-JAN-2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24-JUL-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                             541
                                662
                                                                                            361
                                                                                                                                                                                                                421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADE87062;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sun Y,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 12
ADE87062
AX
AXC ADE87
XX
DY 29-JA
DY 2
                                                                      के विके
                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This invention relates to novel nucleic acids and proteins present in normal and neoplastic pancreatic calls. Pancreatic cancer is a common cause of cancer death worldwide, therefore accurate methods of diagnosis and treatment are required. Compounds which modulate the proteins of the invention may have cytostatic activity and the protein and DNA sequences of the invention may be useful for the development of a vaccine or in gene therapy. The composition and methods are useful in diagnosing, anotheroring, preventing or treating pancreatic cancer and non-cancerous disease states of the pancreas. The present sequence is that of a human pancreatic protein of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New pancreatic specific nucleic acid molecule or protein for diagnosing, staging, imaging, monitoring, preventing or treating pancreatic cancer or non-cancerous disease states of the pancreas.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPPGAVGPAGKDGEAGAQGPPGPAGPAGEKGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 661
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSPGSPGFDGKTGPPGPAGQDGRPGPPGARGQAGGWGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                      neoplastic pancreatic cell; pancreatic cell; pancreatic cancer; cancer death; cytostatic; vaccine; gene therapy; non-cancerous pancreas disease; human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ouery Match 96.6%; Score 2966; DB 7; Length 1211; Best Local Similarity 95.6%; Pred. No. 3e-169; Matches 520; Conservative 21; Mismatches 3; Indels 0
                                                                                                                                                                                Human pancreatic cell protein sequence SeqID517.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim 12; SEQ ID NO 517; 635pp; English.
   Ą.
   standard; protein; 1211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19-DEC-2002; 2002WO-US040655.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21-DEC-2001; 2001US-0342768P.
                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (DIAD-) DIADEXUS INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2003-587286/55.
N-PSDB; ADE87397.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 1211 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                          WO2003060145-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sun Y, Liu C;
                                                                                                                                                                                                                                                                                                                                                                   Homo sapiens.
                                                                                                                         29-JAN-2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       24-JUL-2003.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      542
   ADE87057
                                                            ADE87057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         602
```

셤

6 6 6

8 8 ద

유  $\stackrel{>}{\circ}$ 

ò

; 0

Gaps

ద 8 g ò g ò 임 ò

```
GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          561 GAPGLOGMPGERGAAGLPGPKGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    621 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGP
                                                                                                                                                                                                       Disclosure; Fig 7; 59pp; English.
            95CA-02151547
                                    94US-00259263
                                                             (USSU ) US SURGICAL CORP
                                                                                       Espino P;
                                                                                                              1996-140144/15.
                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
Matches 520; Conserv
                                                                                                                                                                                                                                                                                                                                                              Sequence 1388 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               744
                                                                                                                            N-PSDB; AAT16517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               741 GKEG
                                    10-JUN-1994;
            12-JUN-1995;
                                                                                       Gruskin EA,
                                                                                                                                                                                                                                                                                                                                                                                                                                       Н
                                                                                                                                                                                                                                                                                                                                                                                                                                                               201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       381
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              681
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        541
엄
                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                              d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 엄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                  240
                                                             120
                                                                                       481
                                                                                                               180
                                                                                                                                        541
                                                                                                                                                                                          601
                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                            661
                                                                                                                                                                                                                                                                      360
                                                                                                                                                                                                                                                                                             721
                                                                                                                                                                                                                                                                                                                        420
                                                                                                                                                                                                                                                                                                                                               781
                                                                                                                                                                                                                                                                                                                                                                         480
                                                                                                                                                                                                                                                                                                                                                                                                  841
                                                                                                                                                                                                                                                                                                                                                                                                                          540
                                                                                                                                                                                                                                                                                                                                                                                                                                                   901
                                   421
            9
                                                                                                                                                                                                                   GPPGAVGPAGKDGEAGAEGPPGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                    GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE
                                                                                                                                                                                                                                                                                  GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                         GSEGPQGVRGEPGPPGPPGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ
                                                             GPGGPPGPKGDSGBPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                           GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                              GSPGSPGFDGKTGPPGPAGQDGRPGPPGPPGPRGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                  602 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPPGEAGKPGEQ
                                                                                                                                                                                                                                                                                                                                      GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                         GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                        GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDPGPP
                                                                                                                                                                                                                                                                                                                                                                                                                          GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                 842 GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPA
                                                                                                               GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                       GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                       361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Transforming growth factor, TGF-beta-1, collagen IA; osteogenesis; bone formation; tissue repair; fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1, .1057
/label= Collagen-IA
/note= "collagen IA alpha-helical domain"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     amino acid"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             'note= "unidentified amino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1058. .1059
/label= Linker_peptide
1060. .1388
/label= Decorin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note= "unidentified 890
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAR89471 standard; protein; 1388 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Collagen/decorin fusion protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GKEG 905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-OCT-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CA2151547-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                11-DEC-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Synthetic
                                                                                     122
                                                                                                              121
                                                                                                                                       482
                                                                                                                                                                 181
                                                                                                                                                                                         542
                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                               722
                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                782
                                                                                                                                                                                                                                                                                                                                                                                                                          481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAR89471;
                                                             61
                                                                                                                                                                                                                                                                    301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Peptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Domain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 13
AAR89471
```

g

ò 셤 ò 임 à g à В à g

```
A fusion protein (AAR89471) comprises the alpha-helical region of human collagen I(a) linked to human dermatan sulphate proteoglycan (decorin). It can be expressed in Escherichia coli transforamente carrying a vector incorporating a chimeric gene (AAT16517) coding for the fusion. The decorin binds to type I collagen and thus affects Elbril formation. It inhibits the cell attachment-promoting activity of collagen and this fibrinogen by binding to such molecules near their cell binding sites. The collagen molety provides an integral substratum or scaffolding for the decorin. The fusion protein acts to reduce scarring of healing tissue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            441 GPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61. GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
Chimaeric DNA encoding protein contg. extracellular matrix protein doma - and cellular regulatory factor domain, partic. useful as osteogenic agents, also related vectors, transformed cells and chimaeric proteins.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361 GAPGLEGMPGERGAAGLFGPKGDRGDAGFKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ;
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 1388;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96.6%; Score 2966; DB 2;
llarity 95.6%; Pred. No. 3.4e-169;
Conservative 21; Mismatches 3;
```

ö

9

180 380 240

320

300

560 420 620 480 680 540 740

240

us-10-658-989a-4.rag

```
GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                           899 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Homo sapiens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22-AUG-2002.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26-NOV-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                        ABG93947;
 181
                                                     241
                                                                                                       301
                                                                                                                                                          361
                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                 481
                                                                                                                                                                                                                                                                                                                                                                                     RESULT 15
                                                                                                                                                                                                                                                                                                                                                                                                  ABG93947
                                                                                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                        g
                     셤
                                                                          ద
                                                                                                       ò
                                                                                                                            B
                                                                                                                                                          ò
                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                     ò
                                                  જ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 The invention provides a method for the production of fibrillar collagen.

The method comprises: (a) culturing a recombinant host cell comprising a constant and a fibrillar collagen monomer lacking a C propertide SSAD (c) DNA encoding a fibrillar collagen monomer lacking a C propertide SSAD (sequence selection and alignment domain); and (b) producing the fibrillar collagen. The methods are used to produce fibrillar collagen, comprising DNA encoding a collagen fibrils can be derived. Host cells, comprising DNA encoding a collagen monomer lacking SSAD or N propeptide is used to produce gelatin. Collagen is used in biological research as a substrate for in vitro cell culture and as a component of biocompatible matrices, artificial skin and wound dressing and healing devices. Gelatin is particularly useful for foodstuffs and medicine, for coating tablets and making capsules. The methods, comprising the use of collagen monomers lacking the N and/or C propeptides, result in a large increase in the production of type I collagen. The present sequence represents the human preproalpha I (I) collagen (GenBank Accn no: AP017178)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               359 GSEGPQCVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIACAPGFPGARGPSGPQ 418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 GSEGPEGVRGEPGFPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE 60
                                                                                                                                                        Fibrillar collagen; C propeptide; SSAD; telopeptide; gelatin; sequence selection and alignment domain; prosthetic implant; foodstuff; medicine; type I collagen; human.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           419 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                     New method for production of fibrillar collagen, useful for preparing telopeptide collagen fibrils and gelatin.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ..0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 1411;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
96.6%; Score 2966; DB 3;
Best Local Similarity 95.6%; Pred. No. 3.4e-169;
Matches 520; Conservative 21; Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                                     Chisholm GE;
                                                   AAY56800 standard; protein; 1411 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Example 1; Fig 3A-B; 30pp; English.
                                                                                                                                                                                                                                                                                                                                                           (COHE-) COHESION TECHNOLOGIES INC.
                                                                                                                                  Human preproalpha 1 (I) collagen.
                                                                                                                                                                                                                                                                                                                    98US-0084828P.
99US-00289578.
                                                                                                                                                                                                                                                                                          99EP-00303470.
                                                                                                       (first entry)
                                                                                                                                                                                                                                                                                                                                                                                     Hitzeman RA,
                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 2000-074666/07.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 1411 AA;
                                                                                                                                                                                                               Homo sapiens.
                                                                                                                                                                                                                                                                                          04-MAY-1999;
                                                                                                       27-MAR-2000
                                                                                                                                                                                                                                                                                                                     08-MAY-1998;
                                                                                                                                                                                                                                                                                                                                   10-APR-1999;
                                                                                                                                                                                                                                       EP967226-A2.
                                                                                                                                                                                                                                                                 29-DEC-1999
                                                                                                                                                                                                                                                                                                                                                                                     Olsen DR,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                             AAY56800;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               479
                            RESULT 14
                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
```

. .

```
540
                                                                                                                               658
                                                                                                                                                                                    GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                    718
                                                                                                                                                                                                                                                                                          420
                                                                                                                                                                                                                                                                                                                                          778
                                                                                                                                                                                                                                                                                                                                                                                                480
                                                                                                                                                                                                                                                                                                                                                                                                                                                      838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           868
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Stimulating or inhibiting cell growth and/or division, useful for stimulating chondrogeneels, cartilage, disc or connective tissue growth, repair, and/or regeneration, comprises administering deer antler cartilage gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The invention discloses a method for stimulating or inhibiting cell growth and/or division which comprises contacting or inserting into an animal cell a polypeptide comprising one of the deer antler cartilage
539 GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGPAGQAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                     599 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ
                                                                                                                                                                                                                 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                          GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                   GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Human; deer; rat; mouse; DACC; deer antler cartilage cell;
cell stimulation; cell inhibition; cell growth; cell division;
mesenchymal cell; chondrocyte; chondrogenesis; osteogenesis; growth;
repair; regeneration; restoration; extracellular matrix;
cartilaginous matrix; cartilage; disc; connective tissue; agonist;
antagonist; gene therapy.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Human polypeptide orthologous to DACC-11.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 13; Page 154-160; 214pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ABG93947 standard; protein; 1461 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15-FEB-2001; 2001AU-00003116.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .5-FEB-2002; 2002WO-AU000163.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADPP-) ADP PHARM PTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (UNSY ) UNIV SYDNEY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 2002-643456/69.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Roubin R, Ghosh P;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO200264625-A1.
```

these polypeptides stimulating mesenchymal cell growth and/or division and to transfecting these cells and chondrocytes with vectors carrying the genes of these polypeptides capable of stimulating chondrocytes carrying the genes of these polypeptides capable of stimulating chondrocytes selectively express genes required extendences; growth, repair, regeneration and/or restoration of the extendence matrix. The chondrocytes selectively express genes required to carriagations matrix. The DACC polypeptides and polymoteotides are useful for identifying an agent that modulates the activity of the polypeptide, for stimulating mesenchymal cells growth and/or division by exposing animal mesenchymal cells for onditioned media or its active fraction, obtained from deer antler cartilage cells, for inhibiting cell growth and/or division by inspective of the polymoteotide encoding the DACC. The inhibits the translation of the polymoteotide encoding the DACC. The method and the polypeptides are useful for stimulating mesenchymal cell growth and/or division or for stimulating chondrogenesis, cartilage, discorrent tassue growth, repair, regeneration and/or restoration in an animal. The polymucleotides, polypeptides, agonists and antagonists and animal cell gentify other proteins, which bind to or interact with the polypeptide and are involved in modulating cell growth and/or division. The sequences presented in ABG99923-ABG9948 are the proteins encoded by the DACC CDNA clones 

Sequence 1461 AA;

ô 538 420 598 GVPGDLGAPGPSGARGERGFPGERGVQGPPGPAGPRGANGAPGNDGAKGDAGAPGAPGSQ 718 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120 GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQGPPGPAGEEGKRGARGEPGPTGLP 478 121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPRGEAGVMGFPGPKGAAGEPGKAGERGVP 240 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360 778 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPAGPPGADGEPGAKGEPGDAGAKGDAGPP 480 779 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP 838 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE 60 GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK GSPGSPGFDGKTGPPGPAGQDGRPGPPGPRGQARGQACWGFPGPKGAAGEPGKAGERGVP 361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK Gaps , 0 96.6%; Score 2966; DB 5; Length 1461; 95.6%; Pred. No. 3.5e-169; ive 21; Mismatches 3; Indels 0 Best Local Similarity 95.6 Matches 520; Conservative 61 419 181 241 599 301 629 421 Query Match ઠે g à g ò Dp g g 셤 ò à ò g ò

Search completed: September 24, 2004, 11:09:16 Job time : 76.4117 secs

||||| GKEG 902 541 GKEG 544

GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPA 540 

481

₽

8

us-10-658-989a-4.rai

```
GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  539 GSPGSPGPDGXTGPPGPAGDGRPGPPGPPGARGQAGWGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9, Appli:
21, Appli:
4, Appli:
18, Appli:
18, Appli:
20, Appli:
21, Appli:
21, Appli:
22, Appli:
22, Appli:
23, Appli:
24, Appli:
25, Appli:
26, Appli:
26, Appli:
27, Appli:
28, Appli:
28, Appli:
29, Appli:
20, Appli:
20
                                                                                                                                                                                                         September 24, 2004, 11:06:56; Search time 22.3958 Seconds (without alignments) 1254.011 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 9, Applications of the sequence 19, Applications of the sequence 11, Applications of the sequence 11, Applications of the sequence 10, Applications of the sequence 20, Sequence 20, Sequence 12, Sequence 20, Applications of the sequence 10, Applicatio
                                                                                                                                                                                                                                                                                                                                                     US-10-658-989A-4
3070
1 GSEGPEGVRGEPGPPGPAGA......PGPSGDAGPPGPPGPAGKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Issued_Patents_AA:*
    /cgn2_6/ptodata/2/iaa/5A_COMB.pep:*
2: /cgn2_6/ptodata/2/iaa/5B_COMB.pep:*
3: /cgn2_6/ptodata/2/iaa/6A_COMB.pep:*
4: /cgn2_6/ptodata/2/iaa/6B_COMB.pep:*
5: /cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
6: /cgn2_6/ptodata/2/iaa/PCTUS_COMB.pep:*
GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-09-585-887-9

US-09-2389-578-9

US-09-2319-849-4-9

US-08-931-820-1

US-08-963-825-18

US-08-963-825-18

US-09-546-608-18

US-09-570-573-18

US-08-95-10

US-08-95-10

US-08-961-10

US-08-961-10

US-08-961-10

US-09-500-811-20

US-09-500-811-20

US-09-500-811-20

US-09-500-811-20

US-09-519-849-48

US-09-119-849-48

US-08-911-820-4

US-08-931-820-4

US-08-93-825-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      389414 segs, 51625971 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                           protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Minimum DB seq length: 0
Maximum DB seq length: 200000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query
Match Length DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1910

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

1940

                                                                                                                                                                                                                                                                                                                                                                 Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
                                                                                                                                           •
                                                                                                                                           protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Searched:
                                                                                                                                                                                                                     Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š.
                                                                                                                                           ĕ
```

Sequence 10, Appl. Sequence 21, Appl. Sequence 21, Appl. Sequence 21, Appl. Sequence 21, Appl. Sequence 4, Appl. Sequence 53, Appl. Sequence 72, Appl. Sequence 72, Appl. Sequence 3, Appl. Sequence 3, Appl. Sequence 3, Appl. Sequence 132, Appl. Sequence 53, Appl. Sequence 68, Appl. Sequence 68, Appl.		TION OF GELATIN AND COLLAGEN IN RECOMBINANT	Length 1461; Indels 0; Gaps 0	PGAKGADGAPGIAGAPGFFGARGPSGPE 60	PAGEEGKPGARGEPGPTGLP 120	
US-09-289-578-10 US-09-500-811-21 US-09-500-811-21 US-09-570-573-21 US-08-642-255-62 US-08-642-255-53 US-08-642-255-53 US-08-642-255-53 US-08-642-255-53 US-08-642-255-73 US-08-642-255-73 US-08-642-255-73 US-08-642-255-73 US-08-642-255-73 US-08-642-255-73 US-08-642-255-73 US-08-642-255-132 US-08-337-6333A-53 US-08-37-6333A-53 US-08-175-155-68	ALIGNMENTS	7 FOR THE PRODUC TRIPLE HELICAL /585,887 578 828	; Score 2966; DB 4; ; Pred. No. 8.9e-177; 21; Mismatches 3;	SEGPEGVRGEPGPPGPAGPAGPPGADGEPGAKGADGAPGIAGAPG 	GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPQPVGVBGPPQPAGEBGKPGARGEPGPTGL 	GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
1366 4 100708 8 4 9 100708 8 4 9 100708 8 4 9 10064 9 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		us/0958  td R  oert  Hugh  Ronald A  George  VULL-LENG  FILLS  CONDER: US  CONO-05-  CONO-05-  CONO-05-  SER: 09/09  SER: 09/09  SER: 07/09  11  C. 2.0	46 46 Q) Q)	GEPGPPGP	SGEPGA!	SRGFPGA
Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ Რ		RESULT 1  Sequence 9, Application US/09585887  Patent No. 6413742  Patent No. 6413742  REMERAL INFORMATION: APPLICANT: Chang, Robert APPLICANT: Chang, Robert APPLICANT: Chang, Robert APPLICANT: Hitzeman, Ronald A. APPLICANT: Hitzeman, Ronald A. APPLICANT: Hitzeman, Ronald A. APPLICANT: Chisholm, George APPLICANT: Chisholm, George TITLE OF INVENTION: FULL-LENGTH TR. TITLE OF INVENTION: FULL-LENGTH TR. TITLE OF INVENTION: CELLS FILE REFERENCE: 2500203040 CURRENT APPLICATION NUMBER: US/09/5. CURRENT FILING DATE: 1999-04-09 PRIOR FILING DATE: 1998-05-08 NUMBER OF SEC ID NOS: 11 CSC ID NO 9 LENGTH: 1461  LENGTH: Homo sapiens	th 96. Similarity 95. 520; Conservative	GSEGPEGVRGE	GPGGPPGPKGDS  -            SUSY49446AS	GPPGERGGPGS
1881 1871 1871 1871 1871 1871 1872 1872		ULT 1 09-885-887-3 acent No. 6	Query Match Best Local S Matches 520	359	61	٠
2 C C C C C C C C C C C C C C C C C C C		RESULT 1 US-09-585-8 Sequence Patent No GENERAL 1 APPLICAN APPLICAN APPLICAN APPLICAN TITLE OF TITLE O	Query Best I Matche	<u>ک</u> ۾	දු දු	}

240

598

538

N

```
GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                        0;
                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match 96.6%; Score 2966; DB 4; Length 1464; Best Local Similarity 95.6%; Pred. No. 8.9e-177; Matches 520; Conservative 21; Mismatches 3; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                     ; ORGANISM: Homo sapiens
US-09-331-347C-21
                                                                                                                                                                      541 GKEG 544
                                                                                                                                                                                         GKEG 902
                                                                                                                                                                                                                                                                                                                                                                                  LENGTH: 1464
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301
                   g
                                        ò
                                                        q
                                                                                 ò
                                                                                                    셤
                                                                                                                           ò
                                                                                                                                             g
                                                                                                                                                                   ò
                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \dot{\delta}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \delta
                                                                                                                                                                                                                                                          ö
                    420
                                                                                                                                                538
                                                                           GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 778
                                                                                                                            838
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 658
 599 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 658
                                                              GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                    GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPGGPPGPKGNSGEPGAPGSKGDTGAKGEPGPVGVQCPPGPAGEEGKRGARGEPGPTGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  479 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ..
0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 96.6%; Score 2966; DB 4; Length 1461; Best Local Similarity 95.6%; Pred. No. 8.9e-177; Matches 520; Conservative 21; Mismatches 3; Indels 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ; ORGANISM: Homo sapiens
US-09-289-578-9
                                                                                                                                                                                          544
                                                                                                                                                                                                              899 GKEG 902
                                                                                                                                                                                          GKEG
                                                                                                                                                                                                                                                       -09-289-578-9
                      301
                                                              361
                                                                                   719
                                                                                                        421
                                                                                                                           779
                                                                                                                                                                                          541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                      g
                                                                             q
                                                                                                                                                ò
                                                                                                                                                                  g
                     Š
                                                        ò
                                                                                                      ठे
                                                                                                                     g
                                                                                                                                                                                       ò
                                                                                                                                                                                                       q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D
D
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 상 원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
```

NESULT 3

US-09-331-347C-21

US-09-331-347C-21

Sequence 21, Application US/09331347C

Parent No. 6617431

GENERAL INFORMATION:

APPLICATY: Meristem Therapeutics, S.A.

APPLICATY: Meristem Therapeutics, S.A.

TITLE OF INVENTION: obtaining Such and Their Uses

TITLE OF INVENTION: obtaining Such and Their Uses

TITLE REPRENCE: 1149-3

CURRENT APPLICATION NUMBER: US/09/331,347C

CURRENT FILING DATE: 1999-08-17

WUMBER OF SEQ ID NOS: 22

SOFTWARE: Patentin Version 3.1

SEQ ID NO 21 ö 420 540 180 240 119 GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 778 480 838 868 481 541 300 661 360 420 421 601 721 781 9 602 GPPGAVGPAGKDGEAGAQGPPGPAGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 362 GSEGPQGVRGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGARGPSGPQ 121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 181 GSPGSPGPDGKTGPPQPAGEDGRPGPPGPPGPRGAGGPGVMGFPGPKGAAGEPGKAGERGVP GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 482 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE Gaps

à d ò 엄상 g

g

8

\$ B

à

P & P & P

8 6

ò

ö 320 180 380 240 540 662 663 GPAGPAGPPGPIGNVGAPGPKGPRGAAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPV 722 201 GSEGPÇGVKGEPGPPGPAGAAGPAGNPGADGQPGAKGANGAPGIAGAPGFPGAKGPSGPQ 260 440 GPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQGPAGSPGFQGLPGPAGPPGEAGKPGEQ 500 543 GAPGLQGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGARGLTGPIGPPGPAGAPGDK 602 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300 9 261 GPGGPTGARGLVGEPGPAGSKGESGNKGEPGSAGPQGPPGPSGEEGKRGPNGEAGSAGPP 321 GPPGLRGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGPKGSPGEAGRPGEAGLPGAKGLT GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 381 GSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARGQAGVMGFPGPKGAAGEPGKAGERGVP Gaps

330

54

390

450 273 333

630 453

Fr.i

```
Sequence 18, Application US/09500811;
Patent No. 632314
Patent No. 632314
GENERAL INFORMATION:
APPLICANT: Qvist, Per
APPLICANT: Bonde, Martin
TITLE OF INVENTION: A Method for Assaying Collagen Fragments
TITLE OF INVENTION: In Bondy Fluids, A Test Kit and Means for Carrying Out the
TITLE OF INVENTION: Disorders Associated with the Metabolism of
TITLE OF INVENTION: Disorders Associated with the Metabolism of
MUNERS OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
ADDRESSEB: Darby & Darby PC
STREET: 805 Third Avenue
CITY: New York
STREET: New York
CITY: USA
                                                                                                           211 GASGPMGPRGPPGFRBGBBGZAGKPGRPGZRGPPGPZGARGLPGTAGLPGMKGHRGFS 270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             334 GPPGADGAPGDDGAKGDAGAPGAPGSEGAPGLEGMPGERGAAGLPGPKGDRGDAGPKGAD 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        691 GPPGADGQPGAKGEPGDAGAKGDAGPPGPAGPAGPPGPIGNVGAPGAKGARGSAGPPGAT 750
                                                                                                                                                                         271 GLBGAKGBAGPAGPKGZPGSPGZBGAPGZMGPPGPKGNSGEPGAPGSKGDTGAKGEPGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        391 GPAGPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGQDGRPGPPGPPGARA
                                                                                                                                                                                                                                                                                                                                                                                                                       451 GQAGVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAQGPPGPAGPAGERGEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPAGSPGFEGLPGPAGPPGEAGKPGEEGVPGDLGAPGPSGARGEPGFPGERGVEGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    631 GSPGKDGVRGLTGPIGPPGPAGAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGFA
                                                                      1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGE---PGAKGADGAPGIAGAPGFPGAR---
                                                                                                                                                     -----GPSGPEG-----PG--GPPGPKGDSGEPGAPGSKGDTGAKGEPGPV
                                                                                                                                                                                                                                 GVEGPPGPAGEEGKPGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSP
                                                                                                                                                                                                                                                                                                            154 GPAGPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGAR
                                                                                                                                                                                                                                                                                                                                                                                        GEAGVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          394 GSPGKDGVRGLIGPIGPPGPAGAPGDKGESGPSGPAGPTGARGAPGDRGEPGPAGFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPPGADGEPGAKGEPGDAGAKGDAGPPGPAGPAGPPGPTGDVGAPGAKGARGSAGPPGAT
                                   Gaps
                                 27;
                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: IBM PC compatible
COMPUTER: PatentIN Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
FILING DATE:
CLASSIFICATION:
PRIOR APPLICATION DATA:
                                     23;
                Pred. No. 5.5e-166;
; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 514 GFPGAAGRVGPPGPSGDAGPPGPAGKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      87.6%; F1.
                al Similarity 87.6
500; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 7
US-09-500-811-18
                                                                                                                                                       55
                                                                                                                                                                                                                                 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          511
                                                                                                                                                                                                                                                                                                                                                                                        214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        751
                                                                                                             g
                                                                                                                                                       ઠ
                                                                                                                                                                                      엄
                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                    a
                                                                                                                                                                                                                                                                                                        ठ
                                                                                                                                                                                                                                                                                                                                               셤
                                                                                                                                                                                                                                                                                                                                                                                      ò
                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          쉽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       the
of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A Method for Assaying Collagen Fragments in Body Fluids, A Test Kit and Means for Carrying Out Method and Use of the Method to Diagnose the Presence Disorders Associated with the Metabolism of
                                                                                               420
                                                                                                                                                                                                                                                      540
                                       GAPGLQCMPGERGAAGLPGPKGDAGPKGADGSPGKDGVRGLIGPIGPIGPPGAPGDK 620
                                                                                                                                                                         480
                                                                                                                                                                                                               680
                                                                                                                                                                                                                                                                           681 GPAGPAGPPGPIGNVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGNAGPPGPPGPP 740
                GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                  GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGQPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                      GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPPAAAA
                                                                                               GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                         GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 3; Length 1341;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/963,825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  90.9%; Score 2791.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE:
CLASSIFICATION: 436
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/08/187,319
FILING DATE: 21-JAN-1194
ATTORNEY/AGENT INFORMATION:
NAME: GOGORIS, Adda C
REGISTRATION UNMBER: 29,714
REFERENCE/DOCKET UNMBER: 4305/08701
TELECOMMUNICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 18, Application US/08963825; Patent No. 610689; GENERAL INFORMATION: APPLICANT: Qvist, Per APPLICANT: Qvist, Per APPLICANT: Bonde, Martin TITLE OF INVENTION: In Body Fluids, TITLE OF INVENTION: Disorders Assoc NUMBER OF SEQUENCES: 21 CORRESPONDENCE ADDRESS: ADDRESSE: Barby & Darby PC STREET: 805 Third Avenue CITY: New York STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Floppy disk
IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COLLAGEN ALPHA 1 (I)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      : 1341 amino acids
amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       : 212-527-7700
212-753-6237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TELEX: 236687
INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOLECULE TYPE: protein ORIGINAL SOURCE: ORGANISM: Homo sapien
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ZIP: 10022
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                GKEG 544
                                                                                                                                                                                                                                                                                                                                                                    GKEG 744
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IMMEDIATE SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; CLONE: C
US-08-963-825-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LENGTH:
TYPE: am
                                                     501
                                                                                               361
                                                                                                                                  561
                                                                                                                                                                         421
                                                                                                                                                                                                               621
                                                                                                                                                                                                                                                      481
                                                                                                                                                                                                                                                                                                                                541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                    8
                                                                                                                      P
                                                                                                                                                             ò
                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                  à
                                                                                                                                                                                                                                                                               ద
                                                                                                                                                                                                                                                                                                                    à
```

the of

ሻ

Martin

```
TITLE OF INVENTION: A Method for Assaying Collagen Fragments
TITLE OF INVENTION: in Body Fluids, A Test Kit and Means for Carrying Out
TITLE OF INVENTION: Method and Use of the Method to Diagnose the Presence
TITLE OF INVENTION: Disorders Associated with the Metabolism of
CORRESPONDENCES: 21
                                                                                                                                                                           COMPUTER: IBM PC compatible COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOCTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA: RPLICATION NUMBER: US/09/570,573 FILING DATE: CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/187,319
FILLING DATE:
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                               NAME: Gogoris, Adda C
REGISTRATION NUMBER: 29,714
REPERENCE, DOCKET NUMBER: 43
TELECOMMUNICATION INFORMATION:
TELEPHONE: 212-527-7700
                                                                                                        ADDRESSEE: Darby & Darby Po
STREET: 805 Third Avenue
CITY: New York
STATE: New York
COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEX: 236687
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE: protein ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              270
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GVQGPPGPAGEEGKKGARGEPGPTGLPGPPGBRGGPGSRGFPGADGVAGPKGPAGERGSP 390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      271 GLBGAKGBAGPRGZPGSPGZBGAPGZMGPPGPKGNSGEPGAPGSKGDTGAKGEPGPV 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPAGPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGAR 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GEAGVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEE 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GPAGSPGFEGLPGPAGPPGEAGKPGEEGVPGDLGAPGPSGARGEPGFFGERGVEGPPGPA 333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               511 GPAGSPGFOGLPGPAGPPGEAGKPGEOGVPGDLGAPGPSGARGERGFPGERGVQGPPGPA 570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GPPGADGAPGDDGAKGDAGAPGAPGSEGAPGLEGMPGERGAAGLPGPKGDRGDAGPKGAD 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GSPGKDGVRGLTGPIGPPGPAGAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGFA 453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GSPGKDGVRGLTGPIGPPGPAGAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGPA 690
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GPPGADGEPGAKGEPGDAGAKGDAGPPGPAGPPGPIGDVGAPGAKGAKGARGSAGPPGAT 513
                                                                                                                                                                                                                                                                                                                                                                                                  54
                                                                                                                                                                                                                                                                                                                                                                                                                                                           6
                                                                                                                                                                                                                                                                                                                                                                                                                   ------GPSGPEG-----PG--GPPGPKGDSGEPGAPGSKGDTGAKGEPGPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GVEGPPGPAGEEGKPGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSP
                                                                                                                                                                                                                                                                                                                                                                                                1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGE---PGAKGADGAPGIAGAPGFPGAR---
                                                                                                                                                                                                                                                                                                                                                                    27;
                                                                                                                                                                                                                                                                                                                                       Length 1341;
                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                       DB 4;
                                                                                                                                                                                                                                                                                                                                                                    23;
                                                                                                                                                                                                                                                                                                                                    90.9%; Score 2791.5; DB 4
87.6%; Pred. No. 5.5e-166;
iive 21; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GFPGAAGRVGPPGPSGDAGPPGPPGPAGKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          751 GFPGAAGRVGPPGPSGNAGPPGPPGPAGKEG 781
                                                                               4305/08701
       APPLICATION NUMBER: 08/187,319 FILING DATE:
                                                                                                                                                                                                                                                            ORGANISM: Homo sapiens
IMMEDIATE SOURCE:
CLONE: COLLAGEN ALPHA 1 (1)
                                                                                                                                                                                                                                                                                                                                                  Best Local Similarity 87.6
Matches 500; Conservative
                                                                                                                                                                                                              TOPOLOGY: linear
MOLECULE TYPE: protein
ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                              ;
US-09~500-811-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    154
                                                                                                                                                                                                                                                                                                                                                                                                                                                           55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      631
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   274
                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5
C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ें
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ठ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ∂
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
```

29,714 .mp. 4305/08701

: 1341 amino acids amino acid

linea

TYPE: am: TOPOLOGY:

LENGIH:

212-753-6237

TELEFAX:

Homo sapiens

ORGANISM:

```
270
                                                                                                                                                                                                                                                                           330
                                                                                                                                                                                                                                                                                                                                                                                                213
                                                                                                                                                                                                                                                                                                                                                                                                                                   450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              510
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           570
                                                                                                                                                         54
                                                                                                                                                                                                                                    93
                                                                                                                                                                                391 GPAGPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGFDGKTGPPGPAGQDGRPGPPGAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVEGPPGPAGEEGKPGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSP
                                                                                                                                                                                                                                                                                                                                        154 GPAGPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPAGSPGFEGLPGPAGPPGEAGKPGEEGVPGDLGAPGPSGARGEPGFPGERGVEGPPGPA
                                                                                                                                                                                                                                      55 -----GPSGPEG----PG--GPPGPKGDSGEPGAPGSKGDTGAKGEPGPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          214 GEAGVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEE
                                                                                                                27; Gaps
                                                                                                                                                       1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGE---PGAKGADGAPGIAGAPGFPGAR-
                                                                              DB 4; Length 1341;
                                                                          Query Match 90.9%; Score 2791.5; DB 4; Length Best Local Similarity 87.6%; Pred. No. 5.5e-166; Matches 500; Conservative 21; Mismatches 23; Indels
IMMEDIATE SOURCE:
CLONE: COLLAGEN ALPHA 1 (I)
                                   US-09-570-573-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       274
                                                                                                                                                                                                                                                                                                                 94
```

à

Sequence 18, Application US/09570573 Patent No. 6342361 GENERAL INFORMATION: APPLICANT: Qvist, Per

US-09-570-573-18

450

273

630

453

330

390

```
SQUENCE 10, Application US/08468996

| SAGUENCE 10, Application US/08468996
| Patent No. 6645504
| GENERAL INFORMATION:
| APPLICANT: Weller, Howard
| APPLICANT: Weller, Howard
| APPLICANT: Weller, Howard
| APPLICANT: Miller, Ariel
| APPLICANT: Aller, Ariel
| ARIOR APPLICANT: Aller, Ariel
| APPLICANT: Aller, Ariel
| APPLICANT: Aller, Ariel
| ARIOR APPLICANT: Aller, Ariel
| APPLICANT: Aller, Ariel
| APPLICANT: Aller, Ariel
| APPLICANT: Aller, Ariel
| ARIOR APPLICANT: Aller, Ariel
| APRICANT: Aller, Ariel
| Ariel
| Ariel
| Ariel
| Ariel
| Ariel
| Aller, Ariel
| Ari
GVEGPPGPAGEEGKPGARGEPGPTGLPGPPGERGGPGSRGFPGADGVAGPKGPAGERGSP 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPAGSPGFEGLPGPAGPPGEAGKPGEEGVPGDLGAPGPSGARGEPGFPGERGVEGPPGPA 333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GPPGADGAPGDDGAKGDAGAPGAPGSEGAPGLEGMPGERGAAGLPGPKGDRGDAGPKGAD 393
                                                                                                                                                                                                                                                                                                                                                                                                                391 GPAGPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGSPGFDGKTGPPGPAGQDGRPGPPGPPGAR
                                                                                                                                                                                                                                                                                                                                                                                     GEAGVMGFPGPKGAAGEPGKAGERGVPGPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEE
                                                                                                                                                                                                             GPAGSPGFQGLPGPAGPPGEAGKPGEQGVPGDLGAPGPSGARGERGFPGERGVQGPPGPA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5.11 GPRGANGAPGNDGAKGDAGAPGSQGAPGLQGMPGERGAAGLPGPKGDRGDAGPKGAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GPPGADGQPGAKGEPGDAGAKGDAGPPGPAGPAGPPGPPGPIGNVGAPGAKGARGSAGPPGAT
                                                                                                      GPPGADGEPGAKGEPGDAGAKGDAGPPGPAGPPGPIGDVGAPGAKGARGSAGPPGAT
                                                                              -----GPSGPEG-----PG--GPPGPKGDSGEPGAPGSKGDTGAKGEPGPV
                                                                                                                                                                                                                                                                                 GPAGPKGSPGEAGRPGEAGLPGAKGLTGSPGSPGPDGKTGPPGPAGEDGRPGPPGAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GSPGKDGVRGLTGPIGPPGPAGAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     514 GFPGAAGRVGPPGPSGDAGPPGPAGKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GFPGAAGRVGPPGPSGNAGPPGPPGPAGKEG 781
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          511
                                                                                                                                                                               94
                                                                                                                                                                                                                                                                                    154
                                                                                                                                                                                                                                                                                                                                                                                     214
                                                                                                                                                                                                                                                                                                                                                                                                                                         451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     751
                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                   d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            셤
                                                                                                                            g
                                                                                                                                                                          ò
                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                 ઠે
                                                                                                                                                                                                                                                                                                                                                                                ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                           ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A Method for Assaying Collagen Fragments in Body Fluids, A Test Kit and Means for Carrying Out the Method and Use of the Method to Diagnose the Presence of Disorders Associated with the Metabolism of
                                                      630
                                                                                                      453
                                                                                                                                                       690
                                                                                                                                                                                                           513
     GPPGADGAPGDDGAKGDAGAPGAPGSEGAPGLEGMPGERGAAGLPGPKGDRGDAGPKGAD 393
                                   691 GPPGADGOPGAKGEPGDAGAKGDAGPPGPAGPAGPPGPIGNVGAPGAKGARGSAGPPGAT
                                                                                                      GSPGKDGVRGLTGPIGPPGPAGAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGFA
                                                                                                                                 GSPGKDGVKGLTGP1GPPGPAGAPGDKGESGPSGPAGPTGARGAPGDRGEPGPPGPAGFA
                                                                                                                                                                                                        GPPGADGEPGAKGEPGDAGAKGDAGPPGPAGPPGPIGDVGAPGAKGARGSAGPPGAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         4; Length 1341;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDIUM TYPE: Floppy disk COMPUTER: IBM PC COMPATIBLE OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: PATENTIN Release #1.0, Version #1.25 APPLICATION DATA: BY 09/548,608 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
90.9%; Score 2791.5; DB 4
Best Local Similarity 87.6%; Pred. No. 5.5e-166;
Matches 500; Conservative 21; Mismatches 23;
                                                                                                                                                                                                                                                                                                                                       751 GFPGAAGRVGPPGPSGNAGPPGPPGPAGKEG 781
                                                                                                                                                                                                                                                                                                            514 GFPGAAGRVGPPGPSGDAGPPGPPGPAGKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION:
PRIOR APPLICATION DATA:
PRIOR APPLICATION DATA:
PFLING DATE:
ATTORNEY/AGENT INFORMATION:
MAME: GOGOTIS, Adda C.
REGISTRATION NUMBER: 29,714
REFERENCE/DOCKET NUMBER: 4305/08701
TELECOMMUNICATION INFORMATION:
TELEFHONE: 212-527-7700
TELEFAX: 212-523-7770
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 18, Application US/09548608
Patent No. 635542
GENERAL INFORMATION:
APPLICANT: Coviet, Per
APPLICANT: Bonde, Martin
TITLE OF INVENTION: A Method for As:
TITLE OF INVENTION: In Body Fluids;
TITLE OF INVENTION: Disorders Assoc:
NUMBER OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
ADDRESSEE: Darby & Darby PC
STREET: 805 Third Avenue
CITY: New York
STATE: New York
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COLLAGEN ALPHA 1 (I)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TELEFAX: 212-753-6237
TELEX: 236687
INFORMATION FOR SEQ ID NO: 18:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1341 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM: Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MOLECULE TYPE: protein ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ZIP: 10022
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      inear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IMMEDIATE SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-548-608-18
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH:
     334
                                                   571
                                                                                                      394
                                                                                                                                                    631
                                                                                                                                                                                                        454
                                                                                                                                                                                                                                                   엄
                                                                                                                                                                                                                                                                                                                                                       임
                                        g
                                                                                                 à
                                                                                                                                       g
                                                                                                                                                                                          ठ
                                                                                                                                                                                                                                                                                                         8
```

1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGE----PGAKGADGAPGIAGAPGFPGAR---

```
ORGANISM: Homo sapiens
TISSUE TYPE: Collagen type II
US-08-931-820-3
FILING DATE:
INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
LENGTH: 1060 amino acids
                                                                                                                                                                                                    Matches 391; Conservative
                                                                                   MOLECULE TYPE: protein
HYPOTHETICAL: NO
ORIGINAL SOURCE:
                                                              single
                                               TYPE: amino acid
STRANDEDNESS: sir
TOPOLOGY: linear
                                                                          linear
                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    743 GKDG 746
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            481
                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                          323
                                                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                                           383
                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       301
                                                                                                                                                                             Query Match
Best Local S
                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ద
                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                      ద
                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                         셤.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                à
                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                                                                                                                                                                                        유
                                                                                                                                                                                                                                                                                                                      240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              480
                                                                                                                                                                                                                                                                    180
                                                                                                                                                                                                                                                                                             363
                                                                                                                                                                                                                                                                                                                                              423
                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                         GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   603
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           243
                                                                                                                                                                                                                 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                           303
                                                                                                                                                                                                                                                                                                                                                                                             GAPGLRGLPGKDGETGAEGPPGPAGPAGERGEQGAPGPSGFQGLPGPPGPPGPPGRAGKPGDQ 483
                                                                                                                                                                                                                                                                                                                                                                                                                                         GPEGAQGPRGEPGTPGSPGPAGASGNPGTDGIPGAKGSAGAPGIAGAPGPPGPPDPQ
                                                                                                                                                                                                                                                                                  GEVGPPGPAGSAGARGAPGERGETGPPGPAGFAGPPGADGQPGAKGEQGEAGQKGDAGAP
                                                                                                                                                                                                                                  GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                      GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                              364 GRPGDAGPQGKVGPSGAPGEDGRPGPPGPQGARGQPGVMGFPGPKGANGEPGKAGEKGLP
                                                                                                                                                                                                                                                                                                                                                                        GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GESGPSGPAGPTGARGAPGDRGEPGPPGPAGPAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                        Gaps
                                                                                                                                        ö
                                                                                                                Length 1017;
                                                                                                               72.5%; Score 2226; DB 4; Length 10
72.6%; Pred. No. 5.2e-131;
live 39; Mismatches 110; Indels.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL
APPLICANT:
APPLICANT:
TITLE OF INVENTION: Assay LOL C.C.
TITLE OF INVENTION: Assay LOL C.C.
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
CCMPUTER: IBM PC compatible
CCMPUTER: IBM PC compatible
CCMPUTER: PatentIn Release #1.0, Version #1.25 (EPV
COMPUTER: ALTON DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (EPO)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                EP 96202596.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 3, Application US/08931820 Patent No. 6010863 GENERAL INFORMATION:
PRIOR FILING DATE: 1990-10-10
NUMBER OF SEQ ID NOS: 13
SOFFWARE: Patentin version 3.1
SEQ ID NO 10
                                                                                                            Query Match
Best Local Similarity 72.69
Matches 395; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 1
                                                              TYPE: PRT
ORGANISM: Homo sapiens
US-08-468-996-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 541 GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKDG 727
                                                  LENGTH: 1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 11
US-08-931-820-3
                                                                                                                                                                                                                                                                                                                                                                                                424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      604
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               481
                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                             244
                                                                                                                                                                                                                                                                    121
                                                                                                                                                                                                                                                                                               304
                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                          301
                                                                                                                                                                                                                                                                                                                                                                                                                                                    484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              421
                                                                                                                                                                                                                                                                                                                                                                                                                    <u>ک</u> ۾
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              정 . 첫
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \dot{\delta}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ò
                                                                                                                                                                                     셤
                                                                                                                                                                                                                8
                                                                                                                                                                                                                                    न के न के
                                                                                                                                                                                                                                                                                                                                         8 6 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   à
                                                                                                                                                                  ઠ
```

```
the
of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-08-963-825-20
US-08-963-825-20
US-08-963-825-20
US-08-963-825-20
US-08-963-825
Patent No. 6110689
GENERAL INFORMATION:
APPLICANT: Bonde, Martin
TITLE OF INVENTION: A Method for Assaying Collagen Fragments
TITLE OF INVENTION: And Hold and Use of the Method to Diagnose the Presence of TITLE OF INVENTION: Disorders Associated with the Metabolism of NUMBER OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
ADDRESSEE: Darby & Darby PC
                                            ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       682
                                                                                                                                      262
                                                                                                                                                                                                                                                                                                                               382
                                                                                                                                                                                                                                                                                                                                                                              240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GPPCAVGPACKDCEACAEGPPCPACPACERCEECPACSPCFECLPCPACPPCEACKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     502
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             622
                                                                                            9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             203 GPEGAQGPRGEPGIPGSPGPAGASGNPGIDGIPGAKGSAGAPGIAGAPGFPGPRGPPDPQ
                                                                                                                                                                                                                                                                                                                                                                                                       GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA
                                                                                                                                                                                                                                                                                                                GPPGERGAPGNRGFPGQDGLAGPKGAPGERGPSGLAGPKGANGDPGRPGEPGLPGARGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  443 GAPGLRGLPGKDGETGAEGPPGPAGPAGERGEQGAPGPSGFQGLPGPPGPPGEGGKPGDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                         GSEGPEGVRGEPGPPGPAGPAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                        GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP
                                                                                                                                                                                                                        263 GATGPLGPKGQTGKPGIAGFKGEQGPKGEPGPAGPQGAPGPAGEBGKRGARGEPGGVGPI
                                                                                                                                                                                                                                                                                  121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                              GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                            0; . Gaps
  Length 1060
71.7%; Score 2202; DB 3; Length 1
71.9%; Pred. No. 1.7e-129;
ive 40; Mismatches 113; Indels
```

```
481 GPAGPAGPPGFIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPGPA 540
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              71.7%; Score 2202; DB 3; 171.9%; Pred. No. 2.1e-129; ive 40; Mismatches 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOLECULE TYPE: protein
; ORIGINAL SOURCE:
; ORGANISM: Human Type II Collagen
US-09-010-999-1
                                                                                                                                                                                                       Sequence 1, Application US/09010999
Patent No. 6132976
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TELEX: 904136
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
LENGTH: 1418 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 71.7%;
Best Local Similarity 71.9%;
Matches 391; Conservative 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (202) 672-5300
(202) 672-5399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: amino acid
STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         linear
                                                                             544
                                                                                                 855 GXDG 858
                                                                             541 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                              STATE: D.C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELEFAX:
                                                                                                                                                                                      US-09-010-999-1
                                      g
                                                                             ઠે
                                                                                                          Db
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ô
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPPGPAGEEGKPGARGEPGFTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GSPGSPGPDGKTGPPGPAGEDGRPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAFGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121 GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            495 GRPGDAGPQGKVGPSGAPGEDGRPGPPGPPGARGQPGVMGFPGPKGANGEPGKAGEKGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ó
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length 1418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                         OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/963,825
FILING DATE:
CLASSIFICATION: 436
PRIOR APPLICATION NUMBER: US/08/187,319
FILING DATE: 21-JAN-1994
ATTORNEY/AGBWT INPORMATION:
NAME: GOGOTIS, Adda C
REPERENCE/DOCKET NUMBER: 4305/08701
TELEPHONE: 212-527-7700
TELEPHONE: 212-527-7700
TELEPHONE: 212-527-7700
TELEPHONE: 212-527-7700
TELEPHONE: 212-537-7700
TELEPHONE: 212-537-7700
TELEPHONE: 212-537-7700
TELEPHONE: 212-537-7700
TELEPHONE: 212-537-7700
TELEPHONE: 212-53-637
INPORMATION FOR SEQ ID NO: 20: SEQUENCE CRRAACTERISTICS:
LENDTH: 1418 Emino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 71.7%; Score 2202; DB 3; 1
Best Local Similarity 71.9%; Pred. No. 2.1e-129;
Matches 391; Conservative 40; Mismatches 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IMMEDIATE SOURCE:
CLONE: COLLAGEN -ALPHA 1 (II)
                                                                                             COMPUTER: Floppy disk COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-BOEWARRE: Patenty-
ET: 805 Third Avenue
: New York
E: New York
FRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MOLECULE TYPE: protein ORIGINAL SOURCE:
                                                                     ZIP: 10022
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                amino acid
GY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; CLONE: CC
US-08-963-825-20
                                                        COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ઠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             원
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ò
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61 GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGFTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      375 GATGPLGPKGQTGKPGIAGFKGEPGPKGEPGPAGPPGEBGKRGARGEPGGVGPI 434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE 60
995 GPQGPSGAPGPQGPTGVTGPKGARGAQGPPGATGFPGAAGRVGPPGSNGNPGPPGPPGPS
                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INCRMATION:
APPLICANT: Poole, Anthony R.
APPLICANT: Hollander, Anthony P.
APPLICANT: Hollander, Anthony P.
APPLICANT: BILLINGHUREL, R. C.
TITLE OF INVENTION: IMMUNOASSAYS FOR THE MEASUREMENT OF
TITLE OF INVENTION: COLLAGEN DENATURATION AND CLEAVAGE IN CARTILAGE
NUMBER OF SEQUENCES: 16
CORRESPONDENCE ADDRESS:
ADDRESSEE: Foley & Lardner
STREET: 3000 K Street, N.W., Suite 500
COTTY: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 1418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY D.S.

COUNTRY D.S.

ZIP: 20007-5109

COMPUTER READBLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: IBM PC compatible

COMPUTER: IBM PC compatible

COMPUTER: Patentin Release #1.0, Version #1.30

CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/09/010,999

FLING DATE: 22-JAN-1998

CLASSIFICATION DATA:

APPLICATION DATA:

APPLICATION DATA:

APPLICATION DATA:

APPLICATION NUMBER: US 08/448,501

FLING DATE: 17-JUL-1995

RION APPLICATION DATA:

APPLICATION NUMBER: US 07/984,123

FLING DATE: 04-DEC-1992

ATOMES APPLICATION NUMBER: US 07/984,123

FLING DATE: 104-DEC-1992

ATOMES BEACL Stephen A:

REGISTRATION NUMBER: 29,768

REGISTRATION NUMBER: 20,768

REFERENCE/DOCKET NUMBER: 29,768

REGISTRATION NUMBER: 29,768

REGISTRATION NUMBER: 29,768

REGISTRATION NUMBER: 29,768

REFERENCE/DOCKET NUMBER: 29,768

RELECOMMUNICATION NUMBER: 20,768
```

g ò a  $\delta$ d

중 음

상 점

ò g à 엄 à

```
Sequence 20, Application US/09570573
; Sequence 20, Application US/09570573
; Patent No. 6342361
; GENERAL INFORMATION:
APPLICANT: GVASE, Martin
TITLE OF INVENTION: A Method for Assaying Collagen Fragments
TITLE OF INVENTION: In Body Fluids, A Test Kit and Means for Carrying Out t
TITLE OF INVENTION: Method and Use of the Method to Diagnose the Presence of
TITLE OF INVENTION: Disorders Associated with the Metabolism of
NUMBER OF SEQUENCES: 21
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    480
                                                                                                                                                                                                                                                                                                                                                                          GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                     434
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              614
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    301 GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          734
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        794
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       854
                                                                                                                                                                                                                                                                                                                                    374
                                                                                                                                                                                                                                                                                                9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            675 GPPGLQGMPGERGAAGIAGPKGDRGDVGEKGPEGAPGKDGGRGLTGPIGPIGPPGPAGANGEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  315 GPEGAQGPRGEPGTPGSPGPAGASGNPGTDGIPGAKGSAGAPGIAGAPGFPGPRGPPDPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sss gapgirgipgkogerdargepgepageagekgekgeggapgesgeggipgepgegeggg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             615 GVPGEAGAPGLVGPRGERGFPGERGSPGAQGLQGPRGLPGTPGTDGPKGASGPAGPPGAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 481 GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPAA
                                                                                                                                                                                                                                                                                                GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE
                                                                                                                                                                                                                                                                                                                                                                                                    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT
                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                 Length 1418;
                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                   71.7%; Score 2202; DB 4;
71.9%; Pred. No. 2.1e-129;
ive 40; Mismatches 113;
              | LENGTH: 1418 amino acids
| TYPE: amino acid
| TYPE: amino acid
| TYPE: amino acid
| MOLECULE TYPE: protein
| ORIGINAL SOURCE:
| ORGANISM: Homo sapiens
| IMMEDIATE SOURCE:
| CLONE: COLLAGEN -ALPHA 1 (II)
| US-09-500-811-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ы
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE: Darby & Darby
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . 805 Third Avenue
New York
SEQUENCE CHARACTERISTICS:
LENGTH: 1418 amino aci
                                                                                                                                                                                                                     Query Match
Best Local Similarity 71.9
Matches 391; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            855 GKDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      541 GKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                    Н
                                                                                                                                                                                                                                                                                                                                                                                   61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            음
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 염
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ð
                                                                                                                                                                                                                                                                                                      ઠે
                                                                                                                                                                                                                                                                                                                                        셤
                                                                                                                                                                                                                                                                                                                                                                                   ò
                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                 . à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:

GENERAL INFORMATION:

APPLICANT: Qvist, Per

APPLICANT: Qvist, Per

APPLICANT: Qvist, Per

APPLICANT: Bonde, Martin

TITLE OF INVENTION: A Method for Assaying Collagen Fragments

TITLE OF INVENTION: in Body Fluids, A Test Kit and Means for Carrying Out the

TITLE OF INVENTION: Method and use of the Method to Diagnose the Presence of

TITLE OF INVENTION: Disorders Associated with the Metabolism of

TITLE OF INVENTION: Disorders Associated with the Metabolism of

TITLE OF INVENTION: Disorders Associated with the Metabolism of

CORRESPONDENCE ADDRESS:

ADDRESSEE: Darby & Darby PC

STREET: 805 Third Avenue

CITY: New York

STATE: New York

COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                        480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       540
                                                                                                                                                                                                                                                                                                                         GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GPQGPSGAPGPQGPTGVTGPKGARGAQGPPGATGFPGAAGRVGPPGSNGNPGPPGPPGPS 854
    GPPGERGGPGSRGFPGADGVAGPKGPAGERGSPGPAGPKGSPGEAGRPGEAGLPGAKGLT 180
                                        494
                                                                                 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP 240
                                                                                                                                                             GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                     GVPGDLGAPGPSGARGEPGFPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                      GVPGEAGAPGLVGPRGERGFPGERGSPGAQGLQGPRGLPGTPGTDGPKGASGPAGPPGAQ 674
                                                                                                                                                                                                                                                                                                                                                 GEVGPPGPAGSAGARGAPGERGETGPPGTSGIAGPPGADGQPGAKGEQGEAGQKGDAGAP 794
                                                                                                              GRPGDAGPQGKVGPSGAPGEDGRPGPPGPPGPRGQPGVMGFPGPKGANGEPGKAGEKGLP
                                                                                                                                                                                                                                                                                                                                                                                                        GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GPAGPAGPPGPIGDVGAPGAKGARGSAGPPGATGFPGAAGRVGPPGPSGDAGPPGPPA
                         COUNTAL.

ZIP: 10022
COMPUTER READBLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    4305/08701
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/187,319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESULT 14
US-03-500-811-20
's Sequence 20, Application US/09500811
'p Artent No. 6323314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ATTORNEY/AGENT INFORMATION:
NAME: Gogoris, Adda C
REGISTRATION NUMBER: 29,714
REFERENCE/DOCKET NUMBER: 4305
TELEPHONE: 212-527-7700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         50
20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELEX: 236687
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER:
FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GKDG 858
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKEG 544
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TELEFAX:
                                                                                                                                                                                                        555
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  795
                                                                                   181
                                                                                                                         495
                                                                                                                                                                  241
                                                                                                                                                                                                                                                                                       615
                                                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                    675
                                                                                                                                                                                                                                                                                                                                                                                                          421
                                                                                                                                                                                                                                                                                                                                                                                                                                                   735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           481
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          541
      121
                                            435
                                                                                                                                                                                                                                                 301
```

```
ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GPGGPPGPKGDSGEPGAPGSKGDTGAKGEPGPVGVEGPPGPAGEEGKPGARGEPGPTGLP 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     554
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               241 GPPGAVGPAGKDGEAGAEGPPGPAGPAGERGEEGPAGSPGFEGLPGPAGPPGEAGKPGEE 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421 GESGPSGPAGPTGARGAPGDRGEPGPPGPAGFAGPPGADGEPGAKGEPGDAGAKGDAGPP 480
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301 GVPGDLGAPGPSGARGEPGPPGERGVEGPPGPAGPPGADGAPGDDGAKGDAGAPGAPGSE 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    615 GVPGEAGAPGLVGPRGERGFPGERGSPGAQGLQGPRGLPGTPGTDGPKGASGPAGPPGAQ 674
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 GSEGPEGVRGEPGPPGPAGAAGPAGDPGADGEPGAKGADGAPGIAGAPGFPGARGPSGPE 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181 GSPGSPGPDGKTGPPGPAGEDGRPGPPGPPGARGEAGVMGFPGPKGAAGEPGKAGERGVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       495 GRPGDAGPQGKVGPSGAPGEDGRPGPPGPQGARGQPGVMGFPGPKGANGEPGKAGEKGLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361 GAPGLEGMPGERGAAGLPGPKGDRGDAGPKGADGSPGKDGVRGLTGPIGPPGPAGAPGDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ó
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 1418;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match 71.7%; Score 2202; DB 4; Length 1 Best Local Similarity 71.9%; Pred. No. 2.1e-129; Matches 391; Conservative 40; Mismatches 113; Indels
ZIP: 10022
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
FILING DATE:
                                                                                                                                 CLASSIFICATION:
CLASSIFICATION DATA:
PRIOR APPLICATION DATA:
APPLICATION DATA:
APPLICATION DATA:
FILING DATE:
FILING DATE:
FILING DATE:
ATTORNEY/AGENT INFORMATION:
NAME: GOGOTIS, Add C
REGISTRATION NUMBER: 29,714
REFERENCE/COCKET NUMBER: 4305/08701
FILEPHONE: 212-527-7700
FILEPHONE: 212-53-6237
FILER: 236687
INFORMATION FOR SEQ ID NO: 20:
SEQUENCE CHARACTERISTICS:
LENGTH: 1418 amino acids
FORDAMATION FOR SEQ ID NO: 20:
SEQUENCE CHARACTERISTICS:
LENGTH: 1418 amino acids
FORDAMATION FOR SEQ ID NO: 30:
SEQUENCE: Protein
ORIGINAL SOURCE:
ORGANISM: Home sapiens
INMEDIATE SOURCE:
CLONE: CCLLAGEN - ALPHA 1 (II)
US-09-570-573-20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ઠે
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               à
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             임
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
```

```
Search completed: September 24, 2004, 11:09:50 Job time : 23.3958 secs
ઠ
                          g
```